PEM-E203VLA Series

User's Manual

Version 1.0

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Table of Contents

How to Use This Manual

Chapter 1 System Overview 1-1

1.1 Introduction 1-1
1.2 Check List 1-1
1.3 Product Specification 1-2
1.4 Mechanical Drawing 1-5
1.5 System Architecture 1-6

Chapter 2 Hardware Configuration 2-1

2.1 Pin definition 2-1

Chapter 3 System Installation 3-1

3.1 Intel® Vallyview CPU 3-1
3.2 Main Memory 3-1
3.3 Installing the Single Board Computer 3-1
3.3.1 Chipset Component Driver 3-2
3.3.2 Intel® Gen7 Graphic Controller 3-2
3.3.3 Realtek RTL811F-CG Fast Ethernet 3-2
3.3.4 Intel HD Audio Controller 3-2
3.3.5 Intel Sideband Fabric Device 3-2
3.3.6 Intel Trusted Execution Engine 3-2
3.4 Clear CMOS Operation 3-3

Chapter 4 BIOS Setup Information 4-1

4.1 Entering Setup -- Launch System Setup 4-1
4.2 Main 4-2
4.3 Configuration 4-3
4.4 Security 4-16
4.5 Boot 4-17
4.6 Save & Exit 4-20

Chapter 5 Troubleshooting 5-1

5.1 Hardware Quick Installation 5-1
5.2 BIOS Setting 5-2
5.3 FAQ 5-2

Appendix A

How to Use This Manual

The manual describes how to configure your PEM-E203 series to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of this QSEVEN Module.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this model of single board computer.

Chapter 2 : Hardware Configuration. Describes the definition and location for Jumpers that you can easily configure your system.

Chapter 3 : System Installation. Describes the CPU, main memory SKU to get a clear information.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

The content of this manual and EC declaration document is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw

Chapter 1
System Overview

1.1 Introduction

Please read this manual carefully before you start with the installation of this hardware device. Also make sure that you adhere to the following rules at any time:

You must discharge your body from electric power as well.

Tool you use must be discharge from electric power as well.

Please do not touch any device or components on the boards.

Portwell, a world leading innovator in the industrial PC(IPC) market, has launched its new PEM-E203 in response to market demand for a simplified embedded system board (ESB) with longevity support.

ETX® holds by ETX® industrial group defines new industrial computer platform in "Module Board" and "Carrier Board" architecture. The "Module Board" equipped processor, chipset, memory and single Ethernet controller on it. The On-The=Shelf Module board allows users to create their own Carrier Board easily and quickly since most critical parts are ready on Module board. ETX® Module board offers expansion interfaces such as PCI Express, IDE, LPT, LAN, SATA, LVDS, USB, COM and Audio ext. that could support variety function depending on Carrier board design.

PEM-E203 is a addition to Portwell comprehensive ETX® form factor family; low power consumption via Intel's Atom E38xx processor (less than 5W for a fan-less solution); DDR3L ECC memory up to 8GB; PCIe lanes; 6x USB2.0; a tested operating temperature of -40C to 85C to provide fast operating speed and maintain the small footprint.

The Carrier board was customizes design to fit different mechanicalrequirements. In the meanwhile, its verity functions were also customized to meet the application. Compares to the platform that designed from nothing ETX® architecture platform only needs to develop Carrier board. Users could keep their know-how which to their core competence in the Carrier Board.

1.2 Check List

The PEM-E203 series package should cover the following basic items

- ✓ One PEM-E203 module board

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

#	Requirement	Detailed Description
1	Form Factor	• ETX
2	CPU	• Support Intel Vallyview DDR3LI-Series Processor – Quad Core@ 1.91GHz, 542/792(Turbo) GFx, 1333 DDR3L,~10Watt,IndustryTemp(Tj: -40~110C) – Duo Core@ 1.75GHz, 542/792(Turbo) GFx, 1333 DDR3L,~8Watt, Industry Temp (Tj: -40~110C) – Duo Core@ 1.46GHz, 533/667(Turbo) GFx, 1066 DDR3L,~7Watt, Industry Temp(Tj: -40~110C) – Duo Core@ 1.33GHz,533(No Turbo) GFx, 1066 DDR3L,~6Watt, Industry Temp(Tj: -40~110C) – Single Core@ 1.46GHz, 400(No Turbo) GFx, 1066 DDR3L,~5Watt, Industry Temp (Tj: -40~110C)
3	Memory	• Support DDR3L1066/1333 ECC/Non-ECCmemory on board .shall support memory sizeoptionsof1GB,2GB,4GB and 8GB (TBD) Note: Intel Vally view I-series is up to 4GB/Intel Vally view M-series is up to 8GB
4	I/O Chip	• iTEIT8721F
5	BIOS	• TBD
6	Watchdog Timer	• Programmable via EC F/W from 1sec. to 255min.
7	H/W Monitor	• iTE 8528 Embedded Controller —Temperature (CPUPECI) —Voltage (CPU Vcore, 5VSB, 12V, VDIMM, 3.3V)
8	ISA	• FintekF85226 LPCto ISA Bridge —Signal goes to ETX connector X2
9	PCI	• iTE IT8892PCI bus mastering support —Signal goes to ETX connector X1
10	TPM	• Winbond®WPCT200, TPM1.2(TBD)
11	I2C	• iTE 8528 Embedded Controller I2C interface
12	USB	• Intel BayTrail —4x USB 2.0 portsto ETX connector X1
13	PS/2	• iTEIT8721F —1 x PS/2 KBand 1 x PS/2 MS —Signal goes to ETX connector X3
14	Serial Port	• iTEIT8721F —2x Serial ports, COM1and COM2. —TTL level signals go to ETX connector X3.
15	Parallel Port Floppy	• iTEIT8721F —1 x Parallel port, LPT1.

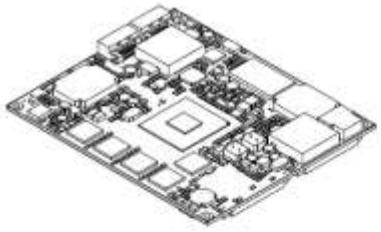
		—1 x Floppy I/F —TTL level signals go to ETX connector X3. —Parallel port and print port are go to X3 together and share the same pins. —H/W strapping with X3, Pin 51 for FDD/PRN function definition in BIOS at boot up.
16	SATA	• Intel BayTrail —1x SATA Port on ETX SATA connector area. —1x On board SATA SSD (optional to SATA connector)
17	IDE	• 1x InnoDiskIDM368 PCI-E to PATA.
18	Graphics Controller	• Intel BayTrail
19	Display Interface	• 1 x VGA 1 output on ETX connector X3 • 1x dual channel 24bit LVDSoutputon ETX connector X3 (LVDSis from CH7511BeDP to LVDS)
20	HDACodec	• Intel High Definition Audio interface • Realtek ALC886 codec.
21	HDACodec	• Intel High Definition Audio interface • Realtek ALC886 codec.
22	LAN	• 1x Realtek®RTL811F-CGFastEthernet. —Signals go to ETX connector X4 —Wake-on-LAN and remote wake-up support
23	Dimension	• 114mm (L) x 95(W) mm x 1.6mm
24	PCB	• 8PCB Layers, 1.6mm thick
25	Power Type	• Power source is from ETX baseboard connector X1, X2, X3 and X4. • External power source type is defined on baseboard. • The ETX board shall power on with AT or ATX mode: Note: AT mode:VCC power source to ETX board without PWRBTN# event. ATX mode: VCC and 5V_SB power source to ETX board with PWRBTN# event.
26	Environment	• Storage Temperature: -40~ 85℃ • Operating temperature: -40~ 85℃ • Operation Humidity: 5% ~ 95%,non-condensing • RoHS compliant
27	EMI Certification	• CE • FCC ClassA
28	Battery	• Battery 3V source is from ETX X4 • Battery should be implemented on baseboard if required.
29	BIOS	• SPI Flash on board.
30	SATA	• 90°SATA Connector *2

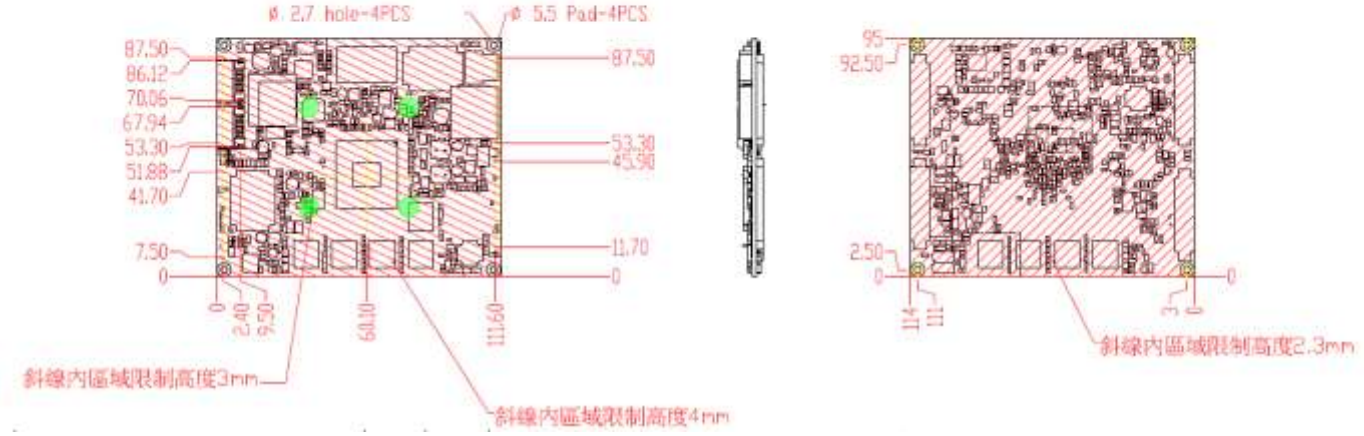
31	ETX Interface	• X1 : PCI, USB, Audio • X2 : ISA • X3:VGA 1, LCD, COM1/2, LPT, IrDA, Mouse, Keyboard. • X4 : IDE 1, Ethernet, Misc.
32	Working under Low temp	• When choosing component, please looking for the parts withIndustrial Grade part.

Design Notice:

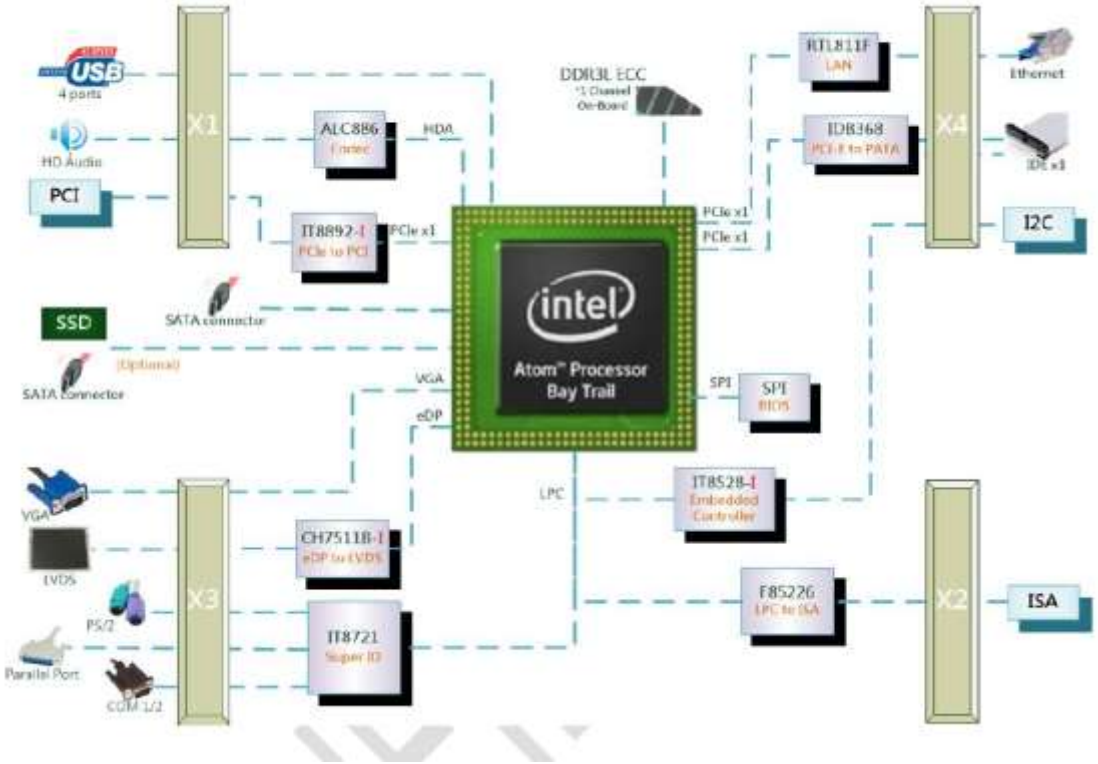
・For the electrical components, beside the core logic, ex: CPU, MCH, ICH, Audio, LAN, etc…Please choose parts with Industrial temp support. We are going to have industrial grade temp type model on this product.

1.4 Mechanical Drawing





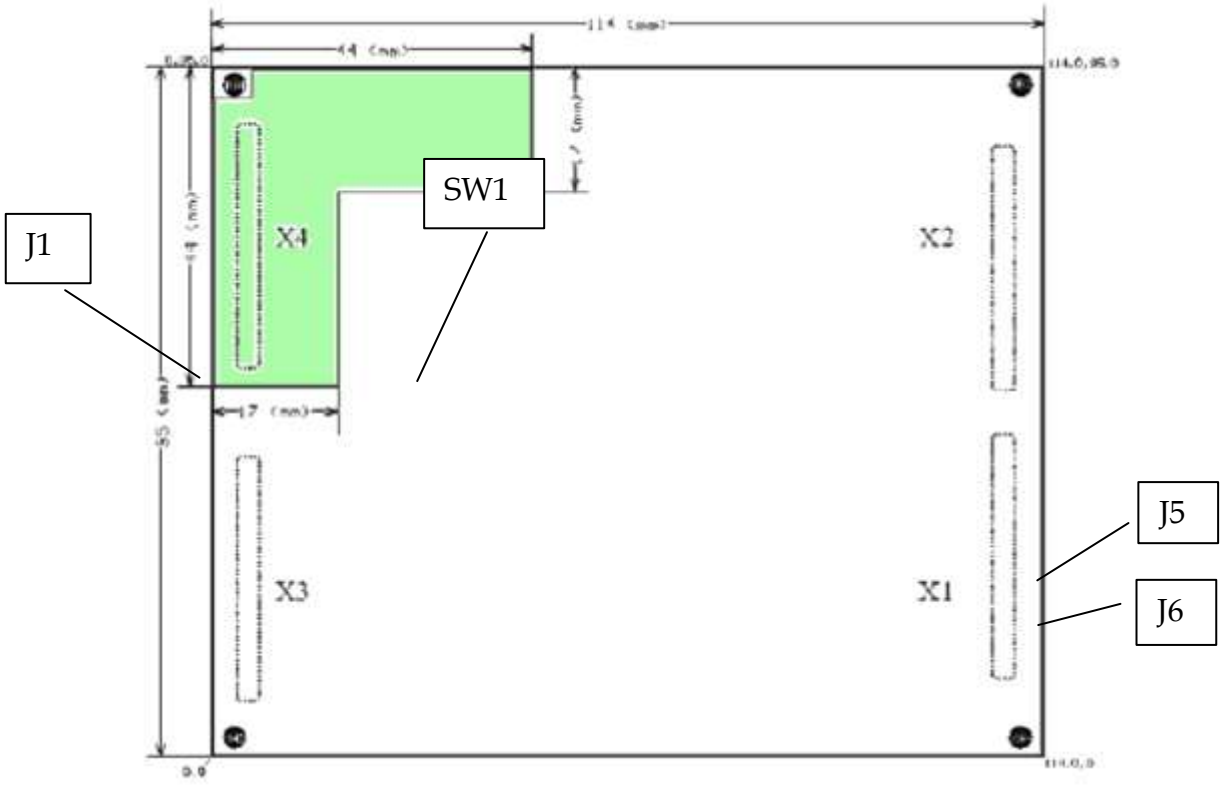
1.5 System Architecture



PEM-E203 Series System Block Diagram

Chapter 2
Hardware Configuration

This chapter indicates connectors' Pin Assignment.



2.1 Pin definition

Connector	Description
X1	ETX X1 100Pin Connector (PCI, USB, Audio)
X2	ETX X2 100Pin Connector (ISA)
X3	ETX X3 100Pin Connector (VGA 1, LCD, COM1/2, LPT, IrDA, Mouse, Keyboard)
X4	ETX X4 100Pin Connector (IDE 1, Ethernet, Misc.)
J2	SATA Connector
J3	SATA Connector
JP3	

Connector X 1

X1 - Pin	Pin Definition of PEM-E203	Interface	I/O Type	X1 - Pin	Pin Definition of PEM-E203	Interface	I/O Type
1	GND	PWR/GND	PWR/GND	51	VCC	PWR/GND	PWR/GND
2	GND	PWR/GND	PWR/GND	52	VCC	PWR/GND	PWR/GND
3	PCICLK3	PCI	O	53	PAR	PCI	IO
4	PCICLK4	PCI	O	54	SERR#	PCI	IO/OD
5	GND	PWR/GND	PWR/GND	55	GPERR#	PCI	IO
6	GND	PWR/GND	PWR/GND	56	NC	NC	NC
7	PCICLK1	PCI	O	57	PEM#	PCI	IO/OD
8	PCICLK2	PCI	O	58	USB2-	USB	IO
9	REQ3#	PCI	I	59	LOCK#	PCI	IO
10	GNT3#	PCI	O	60	DEVSEL#	PCI	IO
11	GNT2#	PCI	O	61	TRDY#	PCI	IO
12	Reserved 3V (Default NC)	*	*PWR Output	62	USB3-	USB	IO
13	REQ2#	PCI	I	63	IRDY#	PCI	IO
14	GNT1#	PCI	O	64	STOP#	PCI	IO
15	REQ1#	PCI	I	65	FRAME#	PCI	IO
16	Reserved 3V (Default NC)	*	*PWR Output	66	USB2+	USB	IO
17	GNT0#	PCI	O	67	GND	PWR/GND	PWR/GND
18	NC	NC	NC	68	GND	PWR/GND	PWR/GND
19	VCC	PWR/GND	PWR/GND	69	AD16	PCI	IO
20	VCC	PWR/GND	PWR/GND	70	CBE2#	PCI	IO
21	SERIRQ	PCI	IO	71	AD17	PCI	IO
22	REQ0#	PCI	I	72	USB3+	USB	IO
23	AD0	PCI	IO	73	AD19	PCI	IO
24	Reserved 3V (Default NC)	*	*PWR Output	74	AD18	PCI	IO
25	AD1	PCI	IO	75	AD20	PCI	IO
26	AD2	PCI	IO	76	USB0-	USB	IO
27	AD4	PCI	IO	77	AD22	PCI	IO
28	AD3	PCI	IO	78	AD21	PCI	IO
29	AD6	PCI	IO	79	AD23	PCI	IO
30	AD5	PCI	IO	80	USB1-	USB	IO
31	CBE0#	PCI	IO	81	AD24	PCI	IO
32	AD7	PCI	IO	82	CBE3#	PCI	IO
33	AD8	PCI	IO	83	VCC	PWR/GND	PWR/GND
34	AD9	PCI	IO	84	VCC	PWR/GND	PWR/GND
35	GND	PWR/GND	PWR/GND	85	AD25	PCI	IO
36	GND	PWR/GND	PWR/GND	86	AD26	PCI	IO
37	AD10	PCI	IO	87	AD28	PCI	IO
38	LINE_IN_L	Audio	I	88	USB0+	USB	IO
39	AD11	PCI	IO	89	AD27	PCI	IO
40	MIC	Audio	I	90	AD29	PCI	IO
41	AD12	PCI	IO	91	AD30	PCI	IO
42	LINE_IN_R	Audio	I	92	USB1+	USB	IO
43	AD13	PCI	IO	93	PCIRST#	PCI	O
44	ASVCC (Default NC)	PWR/GND	PWR/GND	94	AD31	PCI	IO
45	AD14	PCI	IO	95	INTC#	PCI	IO/OD
46	LINE_OUT_L	Audio	O	96	INTD#	PCI	IO/OD
47	AD15	PCI	IO	97	INTA#	PCI	IO/OD
48	ASGND	PWR/GND	PWR/GND	98	INTB#	PCI	IO/OD
49	CBE1#	PCI	IO	99	GND	PWR/GND	PWR/GND
50	LINE_OUT_R	Audio	O	100	GND	PWR/GND	PWR/GND

Connector X2

X2 - Pin	Pin Definition of PEM-E203	Interface	I/O Type	X2 - Pin	Pin Definition of PEM-E203	Interface	I/O Type
1	GND	PWR/GND	PWR/GND	51	VCC	PWR/GND	PWR/GND
2	GND	PWR/GND	PWR/GND	52	VCC	PWR/GND	PWR/GND
3	SD14	ISA	IO	53	SA6	ISA	IO
4	SD15	ISA	IO	54	IRQ5	ISA	I
5	SD13	ISA	IO	55	SA7	ISA	IO
6	MASTER#	ISA	I	56	IRQ6	ISA	I
7	SD12	ISA	IO	57	SA8	ISA	IO
8	DREQ7	ISA	I	58	IRQ7	ISA	I
9	SD11	ISA	IO	59	SA9	ISA	IO
10	DACK7#/RTC_EN	ISA	O	60	SYSCLK	ISA	O
11	SD10	ISA	IO	61	SA10	ISA	IO
12	DREQ6	ISA	I	62	REFSH#	ISA	IO
13	SD9	ISA	IO	63	SA11	ISA	IO
14	DACK6#/4E_EN	ISA	O	64	DREQ1	ISA	I
15	SD8	ISA	IO	65	SA12	ISA	IO
16	DREQ5	ISA	I	66	DACK1#	ISA	O
17	MEMW#	ISA	IO	67	GND	PWR/GND	PWR/GND
18	DACK5#	ISA	O	68	GND	PWR/GND	PWR/GND
19	MEMR#	ISA	O	69	SA13	ISA	IO
20	DREQ0	ISA	I	70	DREQ3	ISA	I
21	LA17	ISA	IO	71	SA14	ISA	IO
22	DACK0#	ISA	O	72	DACK3#	ISA	O
23	LA18	ISA	IO	73	SA15	ISA	IO
24	IRQ14	ISA	I	74	IOR#	ISA	IO
25	LA19	ISA	IO	75	SA16	ISA	IO
26	IRQ15	ISA	I	76	IOW#	ISA	IO
27	LA20	ISA	IO	77	SA18	ISA	IO
28	IRQ12	ISA	I	78	SA17	ISA	IO
29	LA21	ISA	IO	79	SA19	ISA	IO
30	IRQ11	ISA	I	80	SMEMR#	ISA	O
31	LA22	ISA	IO	81	IOCHRDY	ISA	IO
32	IRQ10	ISA	I	82	AEN	ISA	O
33	LA23	ISA	IO	83	VCC	PWR/GND	PWR/GND
34	IO16#	ISA	I	84	VCC	PWR/GND	PWR/GND
35	GND	PWR/GND	PWR/GND	85	SD0	ISA	IO
36	GND	PWR/GND	PWR/GND	86	SMEMW#	ISA	IO
37	SBHE#	ISA	IO	87	SD2	ISA	IO
38	M16#	ISA	IO	88	SD1	ISA	IO
39	SA0	ISA	IO	89	SD3	ISA	IO
40	OSC (CLK_14M_ISA)	ISA	O	90	NOWS#	ISA	I
41	SA1	ISA	IO	91	DREQ2	ISA	I
42	BALE	ISA	O	92	SD4	ISA	IO
43	SA2	ISA	IO	93	SD5	ISA	IO
44	TC	ISA	O	94	IRQ9	ISA	I
45	SA3	ISA	IO	95	SD6	ISA	IO
46	DACK2#	ISA	O	96	SD7	ISA	IO
47	SA4	ISA	IO	97	IOCHK#	ISA	I
48	IRQ3	ISA	I	98	RSTDRV	ISA	O
49	SA5	ISA	IO	99	GND	PWR/GND	PWR/GND
50	IRQ4	ISA	I	100	GND	PWR/GND	PWR/GND

Connector X3

VGA, LCD, Video, COM1, COM2, LPT/Floppy, IrDA, Mouse, Keyboard

Flat-panel Interfaces

EXT modules may implement an LVDS flat-panel interface or parallel, digital flat-panel interface. Please refer the board annual and specific design guide for details of this option.

Pin functions for the shaded pins differ between the two flat-panel interfaces. The unshaded pins have identical functions regardless of interface type.

X3 - Pin	Pin Definition of PEM-E203	Interface	I/O Type	X3 - Pin	Pin Definition of PEM-E203	Interface	I/O Type
1	GND	PWR/GND	PWR/GND	51	Test Point	LPT	I
2	GND	PWR/GND	PWR/GND	52	Test Point	NC	NC
3	R	VGA	O	53	VCC	PWR/GND	PWR/GND
4	B	VGA	O	54	GND	PWR/GND	PWR/GND
5	HSY	VGA	O	55	STB#	LPT	OD
6	G	VGA	O	56	AFD#	LPT	OD
7	VSY	VGA	O	57	NC	NC	NC
8	V_DDC_CLK	VGA	IO	58	PD7	LPT	OD
9	Test Point	LCD	O	59	IRRX	IrDA	I
10	V_DDC_DAT	VGA	IO	60	ERR#	LPT	OD
11	CHB_CLKN	LVDS	O	61	IRTX	IrDA	O
12	CHB_TXN3	LVDS	O	62	PD6	LPT	OD
13	CHB_CLKP	LVDS	O	63	RXD2	COM	I
14	CHB_TXP3	LVDS	O	64	INIT#	LPT	OD
15	GND	PWR/GND	PWR/GND	65	GND	PWR/GND	PWR/GND
16	GND	PWR/GND	PWR/GND	66	GND	PWR/GND	PWR/GND
17	CHB_TXP1	LVDS	O	67	RTS#	COM	O
18	CHB_TXP2	LVDS	O	68	PD5	LPT	OD
19	CHB_TXN1	LVDS	O	69	DTR2#	COM	O
20	CHB_TXN2	LVDS	O	70	SLIN#	LPT	OD
21	GND	PWR/GND	PWR/GND	71	DCD2#	COM	I
22	GND	PWR/GND	PWR/GND	72	PD4	LPT	OD
23	CHA_TXN3	LVDS	O	73	DSR2#	COM	I
24	CHB_TXP0	LVDS	O	74	PD3	LPT	OD
25	CHA_TXP3	LVDS	O	75	CTS2#	COM	I
26	CHB_TXN0	LVDS	O	76	PD2	LPT	OD
27	GND	PWR/GND	PWR/GND	77	TXD2	COM	O
28	GND	PWR/GND	PWR/GND	78	PD1	LPT	OD
29	CHA_TXN2	LVDS	O	79	RI2#	COM	I
30	CHA_CLKP	LVDS	O	80	PD0	LPT	OD
31	CHA_TXP2	LVDS	O	81	VCC	PWR/GND	PWR/GND
32	CHA_CLKN	LVDS	O	82	VCC	PWR/GND	PWR/GND
33	GND	PWR/GND	PWR/GND	83	RXD1	COM	I
34	GND	PWR/GND	PWR/GND	84	ACK#	LPT	OD
35	CHA_TXP0	LVDS	O	85	RTS1#	COM	O
36	CHA_TXP1	LVDS	O	86	BUSY	LPT	OD
37	CHA_TXN0	LVDS	O	87	DTR1#	COM	O
38	CHA_TXN1	LVDS	O	88	PE	LPT	OD
39	VCC	PWR/GND	PWR/GND	89	DCD1#	COM	I
40	VCC	PWR/GND	PWR/GND	90	SLCT#	LPT	OD
41	LVDS_DDC_DAT	LVDS	O	91	DSR1#	COM	I
42	Test Point	LVDS	O	92	MSCLK	MS	I/OD
43	LVDS_DDC_CLK	LVDS	O	93	CTS1#	COM	I
44	BACKLIGHT_EN	LVDS	O	94	MSDAT	MS	I/OD
45	Test Point	LCD	O	95	TXD1	COM	O
46	VDDEN	LCD	O	96	KBCLK	KB	I/OD
47	Test Point	TV	O	97	RI1#	COM	I
48	Test Point	TV	O	98	KBDAT	KB	I/OD
49	Test Point	TV	O	99	GND	PWR/GND	PWR/GND
50	Test Point	TV	O	100	GND	PWR/GND	PWR/GND

Connector X4

X4 - Pin	Pin Definition of PEM-E203	Interface	I/O Type	X4 - Pin	Pin Definition of PEM-E203	Interface	I/O Type
1	GND	PWR/GND	PWR/GND	51	NC	IDE	O
2	GND	PWR/GND	PWR/GND	52	PIDE_IOR#	IDE	O
3	5V_SB	PWR/GND	PWR/GND	53	NC	IDE	I
4	CB_PWROK	MSIC	I	54	PIDE_IOW#	IDE	O
5	PS_ON#	MSIC	O	55	NC	IDE	IO
6	SPEAKER	MSIC	O	56	PIDE_DRQ	IDE	I
7	PWRBTN#	MSIC	I	57	NC	IDE	IO
8	BATT	PWR/GND	PWR/GND	58	PIDE_D15	IDE	IO
9	KBRST#	KB	O	59	NC	IDE	IO
10	LILED#	LAN	O	60	PIDE_D0	IDE	IO
11	Reserved RSMRST# (Default SYS_RESET#)	MSIC	I	61	NC	IDE	IO
12	ACTLED#	LAN	O	62	PIDE_D14	IDE	IO
13	NC	MSIC	I	63	NC	IDE	IO
14	SPEEDLED#	LAN	O	64	PIDE_D1	IDE	IO
15	NC	MSIC	O	65	GND	PWR/GND	PWR/GND
16	I2CLK (from EC)	MSIC	O	66	GND	PWR/GND	PWR/GND
17	VCC	PWR/GND	PWR/GND	67	NC	IDE	IO
18	VCC	PWR/GND	PWR/GND	68	PIDE_D13	IDE	IO
19	USB_OC#	USB	I	69	NC	IDE	IO
20	NC	MSIC	I	70	PIDE_D2	IDE	IO
21	EXTSMI#	MSIC	I	71	NC	IDE	IO
22	I2DAT (from EC)	MSIC	IO	72	PIDE_D12	IDE	IO
23	SMBCLK	MSIC	O	73	NC	IDE	IO
24	SMBDATA	MSIC	IO	74	PIDE_D3	IDE	IO
25	NC	IDE	O	75	NC	IDE	IO
26	SMBALRT#	MSIC	I	76	PIDE_D11	IDE	IO
27	NC	IDE	O	77	NC	IDE	IO
28	DASP_S	IDE	O	78	PIDE_D4	IDE	IO
29	NC	IDE	O	79	NC	IDE	IO
30	PIDE_CS3#	IDE	O	80	PIDE_D10	IDE	IO
31	NC	IDE	O	81	VCC	PWR/GND	PWR/GND
32	PIDE_CS1#	IDE	O	82	VCC	PWR/GND	PWR/GND
33	GND	PWR/GND	PWR/GND	83	NC	IDE	IO
34	GND	PWR/GND	PWR/GND	84	PIDE_D5	IDE	IO
35	NC	IDE	O	85	NC	IDE	IO
36	PIDE_A2	IDE	O	86	PIDE_D9	IDE	IO
37	NC	IDE	O	87	NC	IDE	IO
38	PIDE_A0	IDE	O	88	PIDE_D6	IDE	IO
39	NC	IDE	I	89	NC	MSIC	I
40	PIDE_A1	IDE	O	90	CBLID_P	IDE	I
41	BATLOW#	MSIC	O	91	MDIN1	LAN	I
42	NC	MSIC	O	92	PIDE_D8	IDE	IO
43	NC	IDE	O	93	MDIP1	LAN	I
44	PIDE_INTRQ	IDE	I	94	SIDE_D7	IDE	IO
45	NC	IDE	I	95	MDIN0	LAN	O
46	PIDE_AK#	IDE	O	96	PIDE_D7	IDE	IO
47	NC	IDE	O	97	MDIP0	LAN	O
48	PIDE_RDY	IDE	I	98	PLTRST_BUF_CR_SIO	IDE	O
49	VCC	PWR/GND	PWR/GND	99	GND	PWR/GND	PWR/GND
50	VCC	PWR/GND	PWR/GND	100	GND	PWR/GND	PWR/GND

Chapter 3
System Installation

This chapter provides you with instructions to set up your system.

3.1 Intel® Vallyview CPU

Intel® E3845 (4 core, 10W, 1.91GHz, 1333MT)
Intel® E3827 (2 core, 8W, 1.75GHz, 1333MT)
Intel® E3826 (2 core, 7W, 1.46GHz, 1067MT)
Intel® E3825 (2 core, 6W, 1.33GHz, 1067MT)
Intel® E3815 (1 core, 5W, 1.46GHz, 1067MT)

3.2 Main Memory

PEM-E203 provides DDR3L-SDRAM (1.35V) which supports 1333 MT/s as main memory, with Non-ECC/ECC(Optional) memory on board . The maximum memory can be up to 4GB . Memory clock and related settings can be detected by BIOS via SPD interface.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

3.3 Installing the Single Board Computer

To install your PEM-E203 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position

Step 2 : Place PEM-E203 into the dedicated position in the system
Step 3 : Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.6 to install INF/VGA/LAN/Audio/Sideband Fabric Device/Trusted Execution Engine drivers.

3.3.1 Chipset Component Driver

PEM-E203 uses state-of-art Intel® BayTrail-I chipset. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 8, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in PEM-E203 CD-title

3.3.2 Intel® Gen7 Graphic Controller

PEM-E203 has integrated Intel® Gen7 Graphic which supports DX11, OpenGL3.2. It is the most advanced design to gain an outstanding graphic performance. PEM-E203 supports VGA and Dual channel 24bit LVDS(eDP to LVDS) .

Drivers Support
Please find the Graphic driver in the PEM-E203 CD-title. The driver supports Windows 8.

3.3.3 Realtek RTL811F-CG Fast Ethernet

PEM-E203 itself is a Module Card, the Ethernet port will support one auto negotiating 10/100/1000 Base-T Ethernet interface to the Carrier.

Please find Realtek RTL811F Ethernet driver in the PEM-E203 CD-title. The driver supports Windows 8.

3.3.4 Intel HD Audio Controller

Please find Intel® High Definition Audio driver and Realtek ALC886 codec form PEM-E203 CD-title. The driver supports Windows 8.

3.3.5 Intel Sideband Fabric Device

Please find Intel® Sideband Fabric Device driver form PEM-E203 CD-title. The driver supports Windows 8.

3.3.6 Intel Trusted Execution Engine

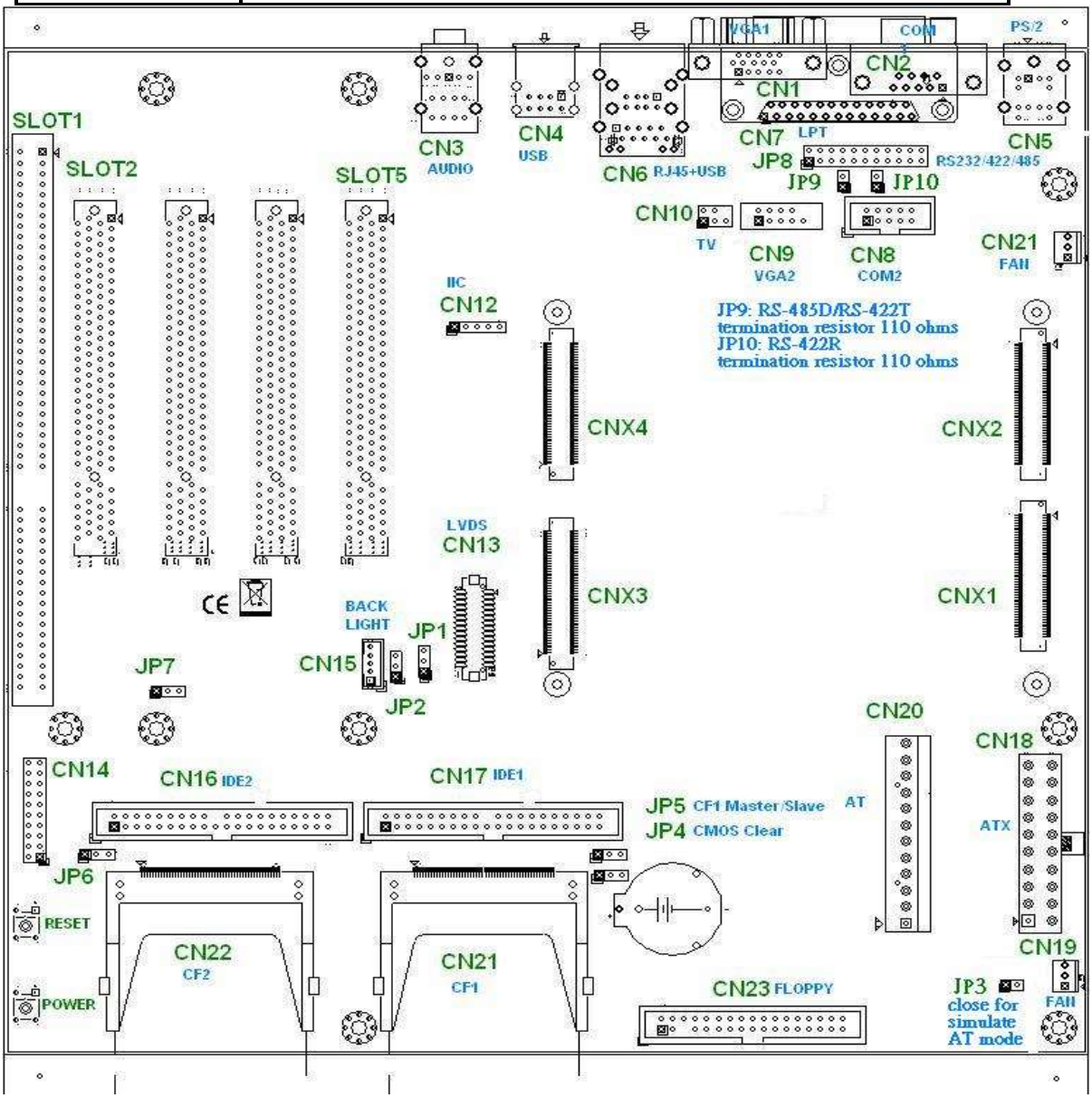
Please find Intel® Trusted Execution Engine driver form PEM-E203 CD-title. The driver supports Windows 8.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumper of the PEM-C200 carrier board.

JP4：CMOS Setting

	Jumper Setting Describe
*1-2	Default
2-3	Clean CMOS



Chapter 4
BIOS Setup Information

PEM-E203 is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, PEM-E203 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

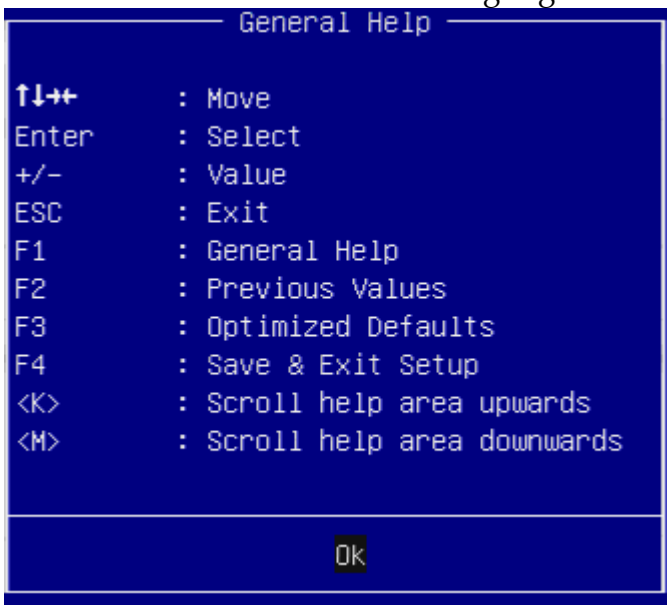
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen.

Press <Del> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

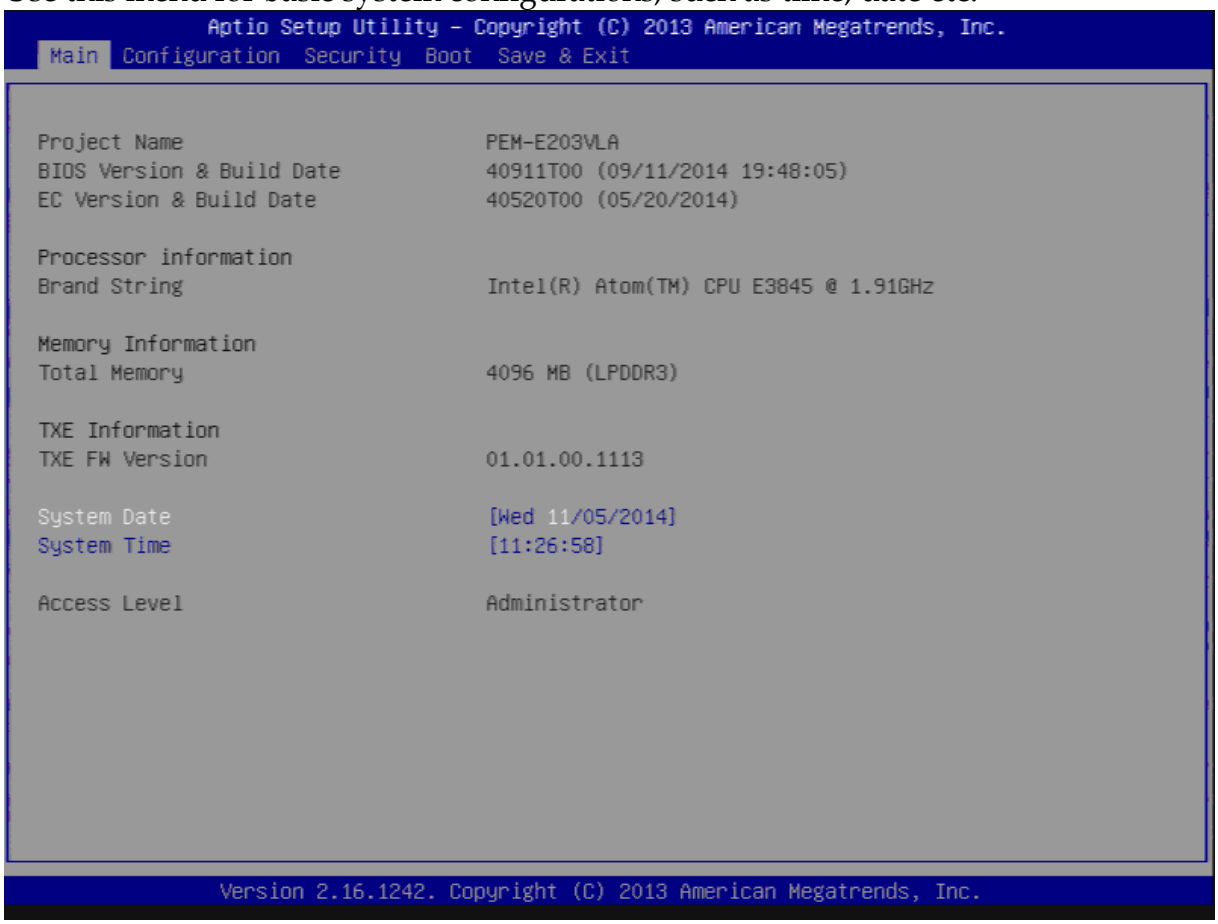
Press <F1> to Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Configuration Security Boot Save & Exit
Project Name PEM-E203VLA
BIOS Version & Build Date 40911T00 (09/11/2014 19:48:05)
EC Version & Build Date 40520T00 (05/20/2014)
Processor information
Brand String Intel(R) Atom(TM) CPU E3845 @ 1.91GHz
Memory Information
Total Memory 4096 MB (LPDDR3)
TXE Information
TXE FW Version 01.01.00.1113
System Date [Wed 11/05/2014]
System Time [11:26:58]
Access Level Administrator
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

System Date

View or set system date.

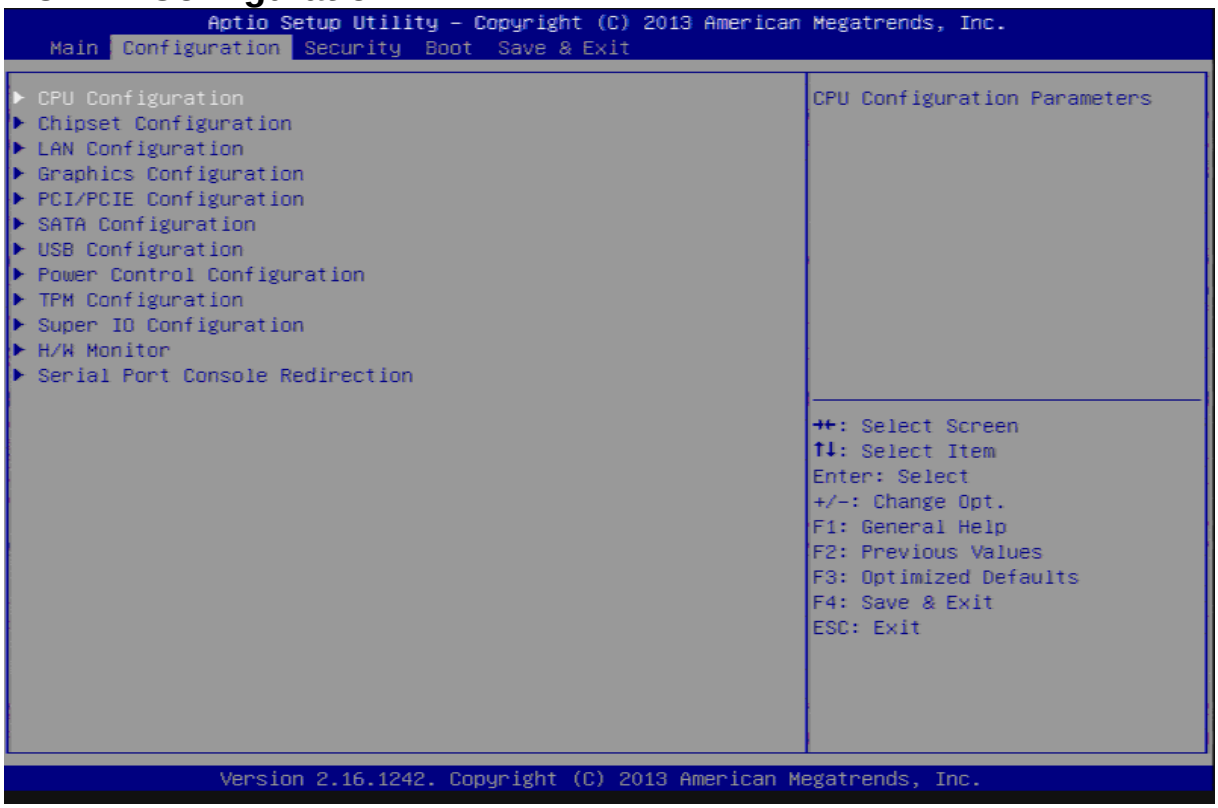
The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

System Time

View or set system time.

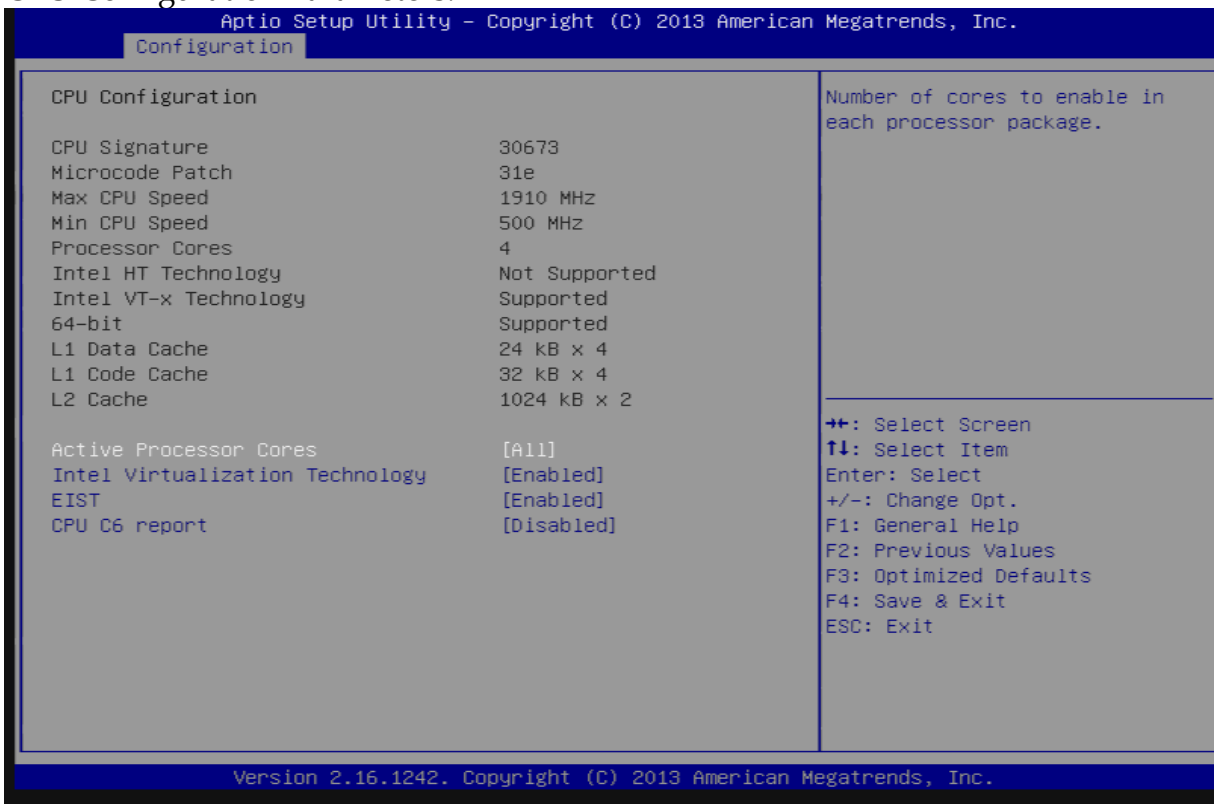
The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

4.3 Configuration



CPU Configuration

CPU Configuration Parameters.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
CPU Configuration
CPU Signature 30673
Microcode Patch 31e
Max CPU Speed 1910 MHz
Min CPU Speed 500 MHz
Processor Cores 4
Intel HT Technology Not Supported
Intel VT-x Technology Supported
64-bit Supported
L1 Data Cache 24 kB x 4
L1 Code Cache 32 kB x 4
L2 Cache 1024 kB x 2
Active Processor Cores [All]
Intel Virtualization Technology [Enabled]
EIST [Enabled]
CPU C6 report [Disabled]
Number of cores to enable in each processor package.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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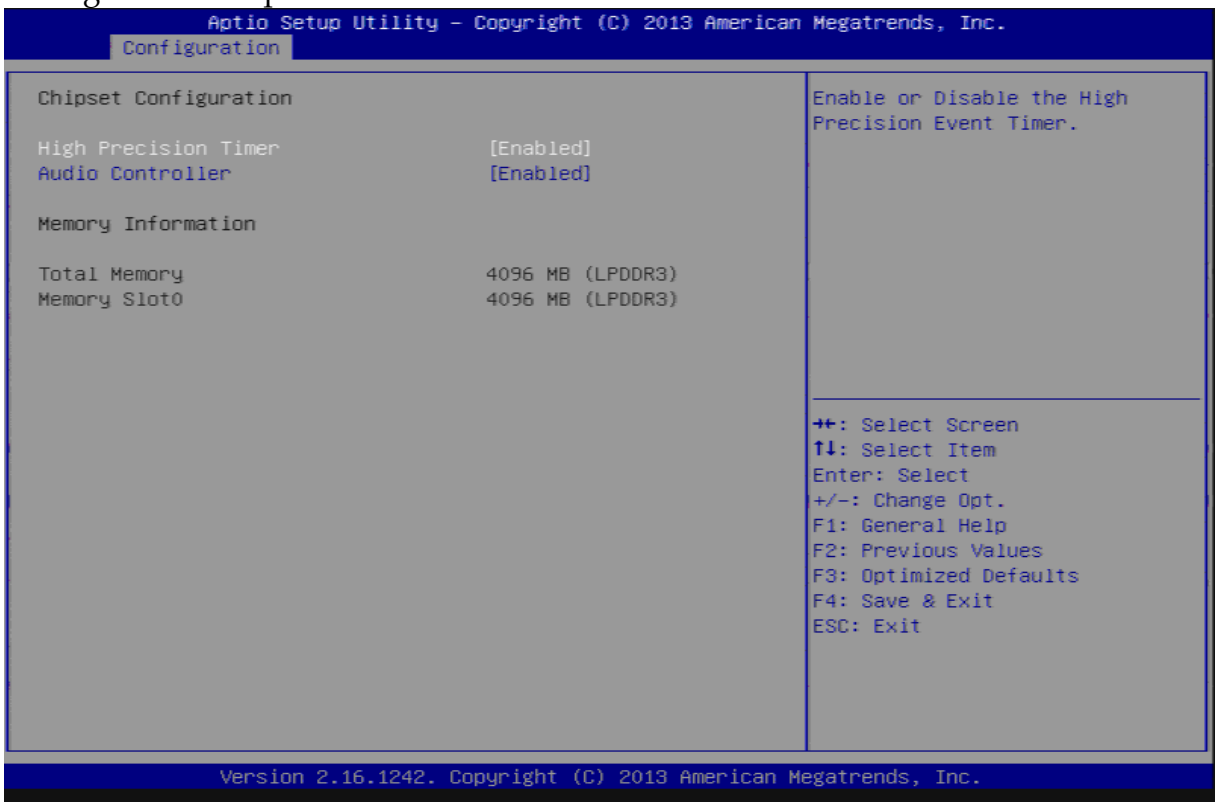
Active Processor Cores
Number of cores to enable in each processor package.
Choices: All, 1.

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Choices: Disabled, Enabled.

EIST
Enable/Disable Intel SpeedStep.
Choices: Disabled, Enabled.

CPU C6 report
Enable/Disable CPU C6 (ACPI C3) report to OS.
Choices: Disabled, Enabled.

Chipset Configuration
Configuration Chipset Feature.



High Precision Timer
Enable or Disable the High Precision Event Timer.
Choices: Disabled, Enabled.

Audio Controller

Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally enabled. Auto = Azalia will be enabled if present. Disable otherwise.
Choices: Disabled, Enabled.

LAN Configuration

Configuration On Board LAN Device.

Launch Legacy PXE Rom

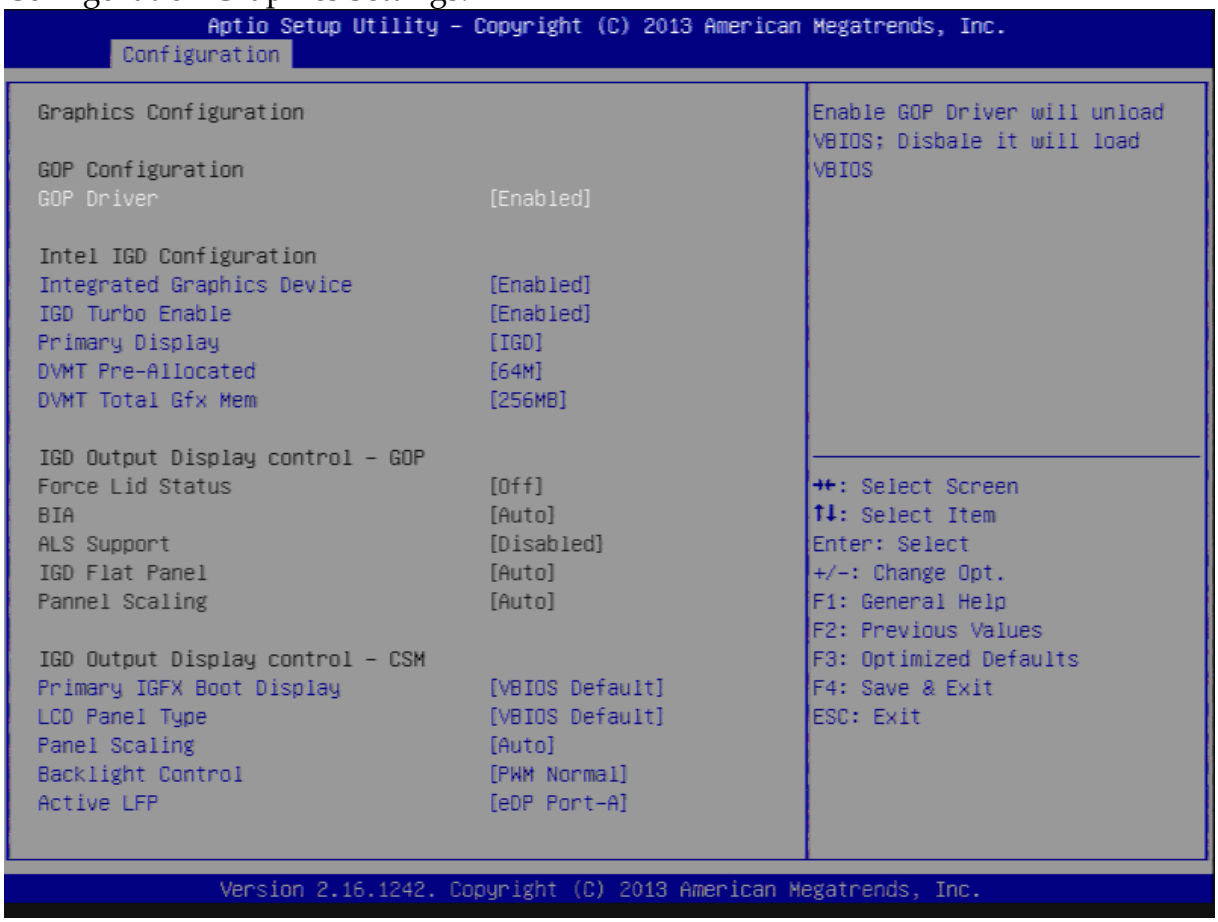
Launch Legacy PXE Rom. [Disable] Not launch Rom, [Enable] Force Launch Rom, [Auto] Auto detect LAN Cable status to Enable/Disable Rom initial.
Choices: Disabled, Enabled, Auto.

Wake on LAN Controller

Choices: Disabled, Enabled.

Graphics Configuration

Configuration Graphics Settings.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
Graphics Configuration
GOP Configuration
GOP Driver [Enabled]
Intel IGD Configuration
Integrated Graphics Device [Enabled]
IGD Turbo Enable [Enabled]
Primary Display [IGD]
DVMT Pre-Allocated [64M]
DVMT Total Gfx Mem [256MB]
IGD Output Display control - GOP
Force Lid Status [Off]
BIA [Auto]
ALS Support [Disabled]
IGD Flat Panel [Auto]
Pannel Scaling [Auto]
IGD Output Display control - CSM
Primary IGFX Boot Display [VBIOS Default]
LCD Panel Type [VBIOS Default]
Panel Scaling [Auto]
Backlight Control [PWM Normal]
Active LFP [eDP Port-A]
Enable GOP Driver will unload VBIOS; Disbale it will load VBIOS
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

GOP Configuration

GOP Driver

Enable GOP Driver will unload VBIOS; Disable it will load VBIOS.
Choices: Enabled, Disabled.

Intel IGD Configuration

Integrated Graphics Device
Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adapter. Disable: Always disable IGD.
Choices: Enabled, Disabled.

IGD Turbo Enable

Enable: Enable IGD Turbo Enable. Disable: IGD Turbo Disable.
Choices: Enabled, Disabled.

Primary Display

Select which of IGD/PCI Graphics device should be Primary Display.
Choices: Auto, IGD, PCI, SG.

DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory sized used by the Internal Graphic Device.
Choices: 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M.

DVMT Total Gfx Mem
Select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.
Choices: 128MB, 256MB, Max.

IGD Output Display Control - CSM

Primary IGFX Boot Display
Select the video device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your election. VGA modes will be supported only on primary display.
Choices: VBIOS Default, CRT,LFP.

LCD Panel Type
Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.
Choices: VBIOS Default, 640x480 LVDS, 800x600 LVDS, 1024x768 LVDS, 1280x1024 LVDS, 1400x1050 (RB) LVDS, 1400x1050 LVDS, 1600x1200 LVDS, 1366x768 LVDS, 1680x1050 LVDS, 1920x1200 LVDS, 1440x900 LVDS, 1600x900 LVDS, 1280x800 LVDS, 1920x1080 LVDS, 2048x1536 LVDS.

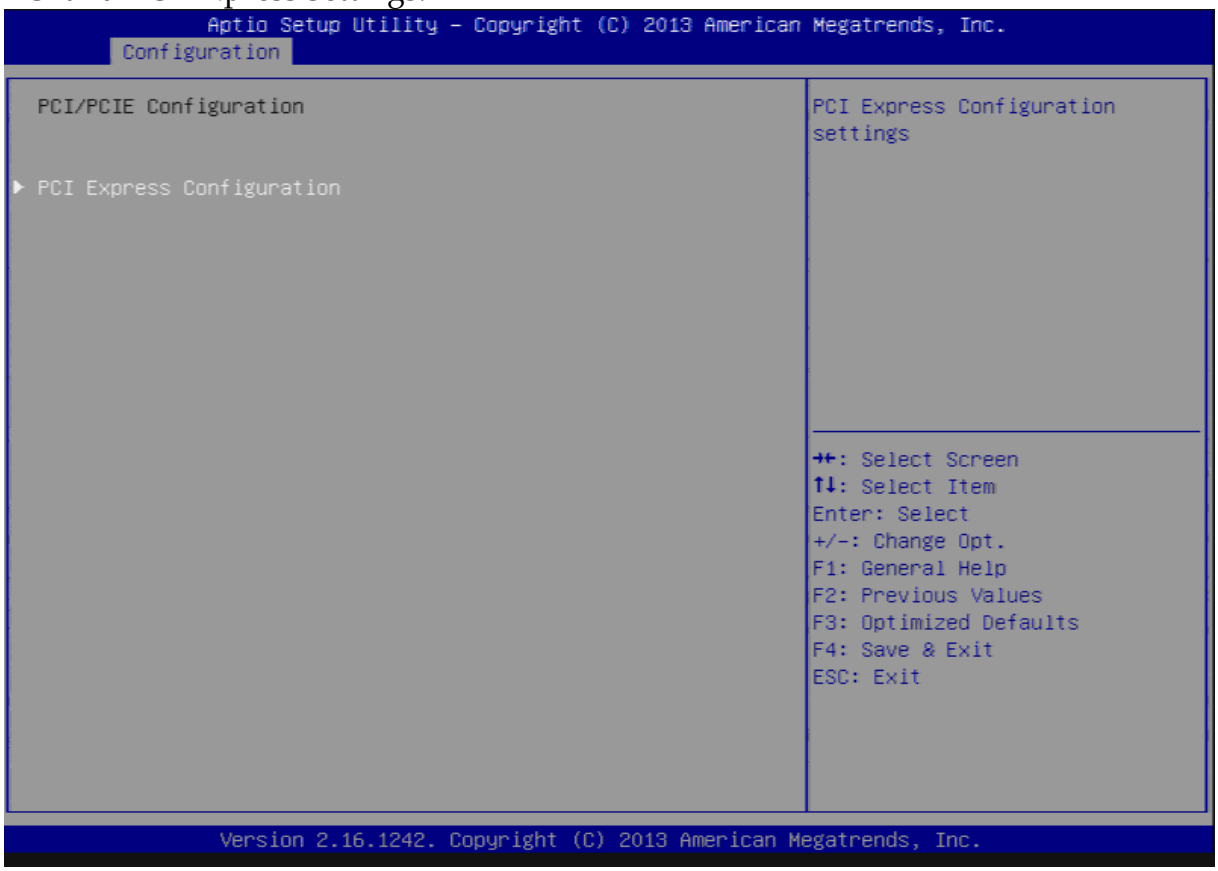
Panel Scaling
Select the LCD Panel scaling option used by Internal Graphic device
Choices: Auto, Off, Force Scaling.

Backlight Control
Back Light Control Setting
Choices: PWM Inverted, PWM Normal, GMBus Inverted, GMBus Normal.

Active LFP
Select the Active LFP configuration.
Choices: No LVDS, eDP Port-A.

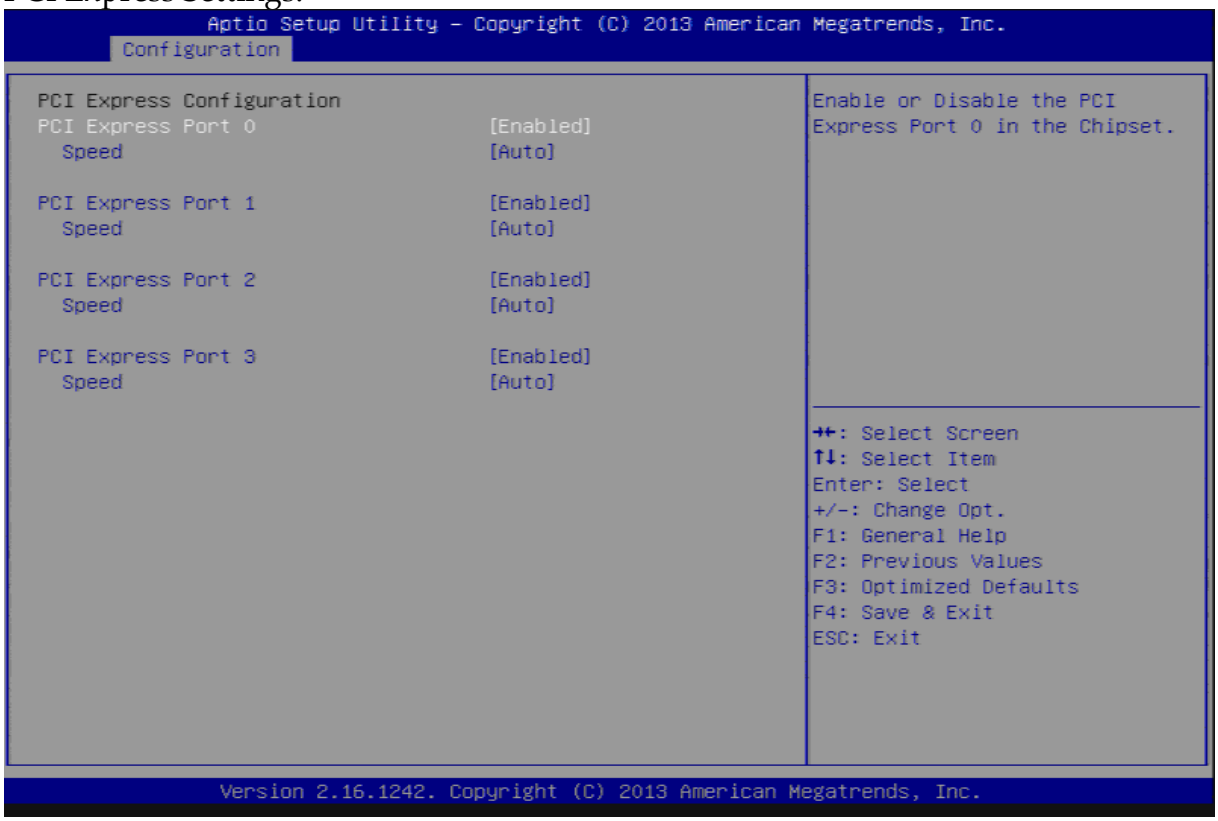
PCI/PCIE Configuration

PCI and PCI Express Settings.



PCI Express Configuration

PCI Express Settings.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
PCI Express Configuration
PCI Express Port 0 [Enabled]
Speed [Auto]
PCI Express Port 1 [Enabled]
Speed [Auto]
PCI Express Port 2 [Enabled]
Speed [Auto]
PCI Express Port 3 [Enabled]
Speed [Auto]
Enable or Disable the PCI Express Port 0 in the Chipset.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

PCI Express Port 0-3
Enable or Disable the PCI Express Port 0-3 in the Chipset.
Choices: Enabled, Disabled.

Speed
Configuration PCIe Port Speed.
Choices: Auto, Gen2, Gen1.

SATA configuration
SATA Device Option Settings.

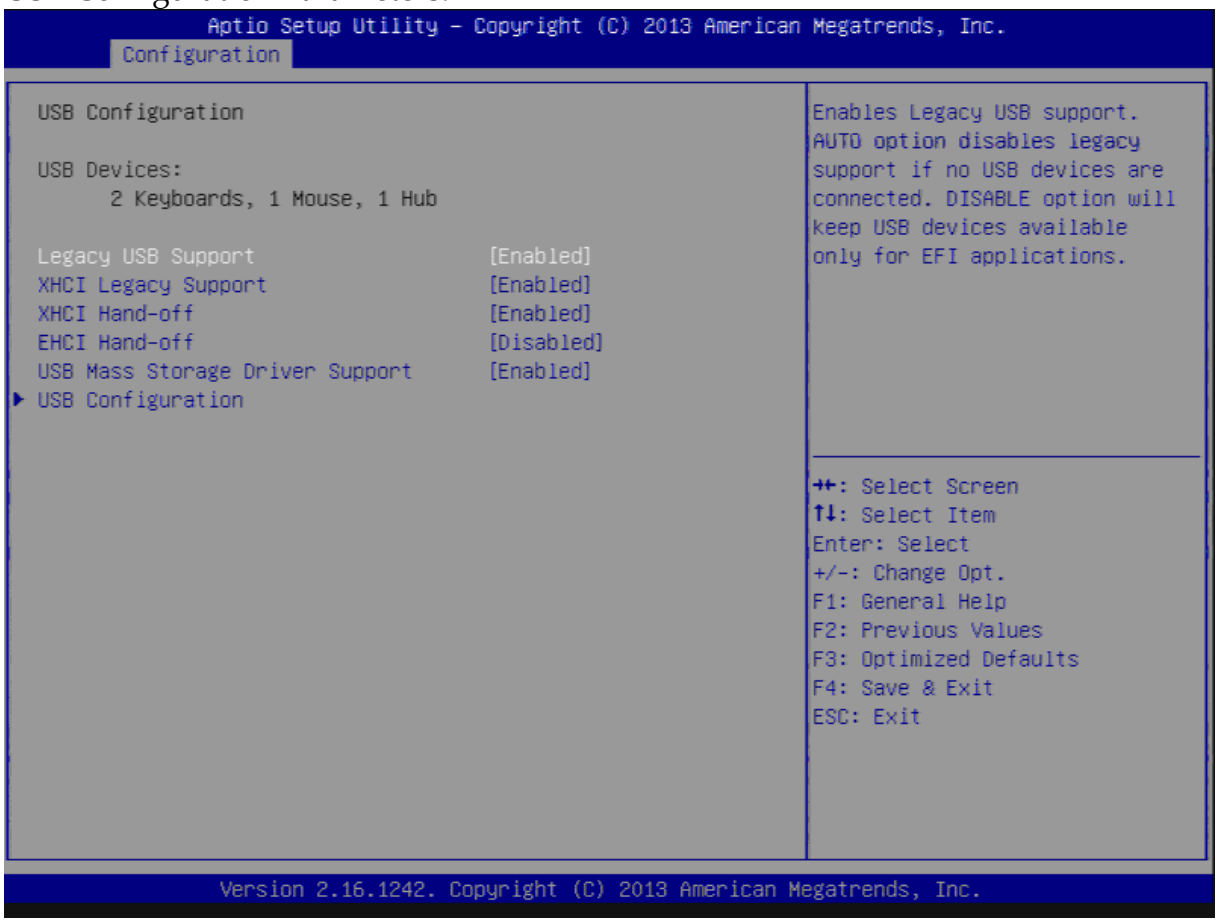
Serial-ATA (SATA)
Enable/Disable Serial ATA.
Choices: Enabled, Disabled.

SATA Mode
Select IDE/AHCI.
Choices: IDE Mode, AHCI Mode.

Serial-ATA Port 0-1
Enable/Disable Serial ATA Port 0-1.
Choices: Enabled, Disabled.

SATA Port 0-1 Hot Plug
Enable/Disable Serial ATA Port 0-1 HotPlug.
Choices: Enabled, Disabled.

USB Configuration
USB Configuration Parameters.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
USB Configuration
USB Devices:
2 Keyboards, 1 Mouse, 1 Hub
Legacy USB Support [Enabled]
XHCI Legacy Support [Enabled]
XHCI Hand-off [Enabled]
EHCI Hand-off [Disabled]
USB Mass Storage Driver Support [Enabled]
USB Configuration
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Legacy USB Support
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disabled option will keep USB devices available only for EFI application.
Choices: Enabled, Disabled, Auto.

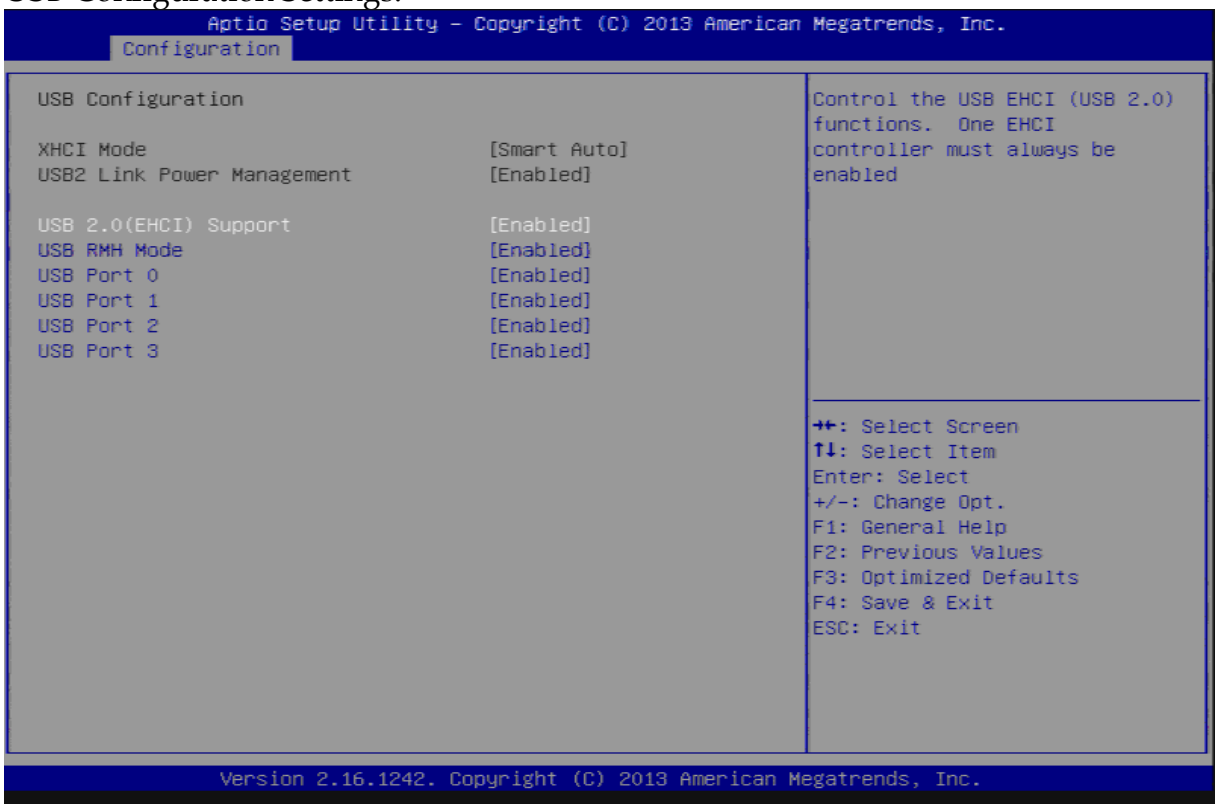
xHCI Legacy Support
Enable/Disable XHCI Controller Legacy support.
Choices: Enabled, Disabled.

xHCI Hand-off
This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
Choices: Enabled, Disabled.

EHCI Hand-off
This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
Choices: Enabled, Disabled.

USB Mass Storage Driver Support
Enable/Disable USB Mass Storage Driver Support.
Choices: Enabled, Disabled.

USB Configuration
USB Configuration Settings.


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
USB Configuration
XHCI Mode [Smart Auto]
USB2 Link Power Management [Enabled]
USB 2.0(EHCI) Support [Enabled]
USB RMH Mode [Enabled]
USB Port 0 [Enabled]
USB Port 1 [Enabled]
USB Port 2 [Enabled]
USB Port 3 [Enabled]
Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

USB 2.0 (EHCI) Support
Control the USB EHCI (USB 2.0) function. One EHCI controller must always be enabled.
Choices: Disabled, Enabled.

USB RMH Mode
Choices: Disabled, Enabled.

USB Port 0~3
Enable/Disable USB port 0~3
Choices: Disabled, Enabled.

Power Control Configuration

System Power Control Configuration Parameters.

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
Power Control Configuration
Enable Hibernation [Enabled]
ACPI Sleep State [S3 (Suspend to RAM)]
Restore AC Power Loss [Last State]
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Enable Hibernation

Enable or Disable system ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
Choices: Disabled, Enabled.

ACPI Sleep state

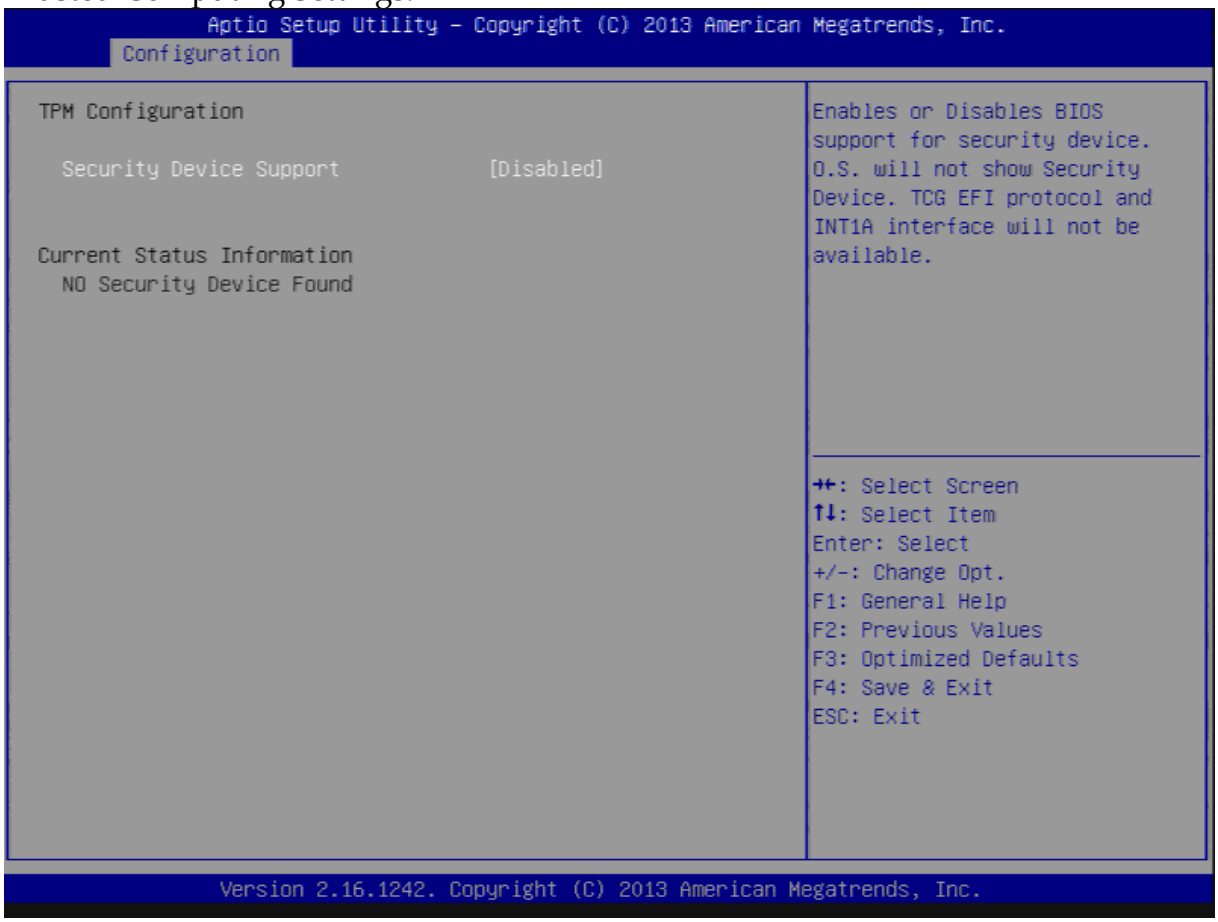
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
Choices: Suspend Disabled, S3 (Suspend to RAM).

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.
Choices: Power off, Power On, Last State.

TPM Configuration

Trusted Computing Settings.

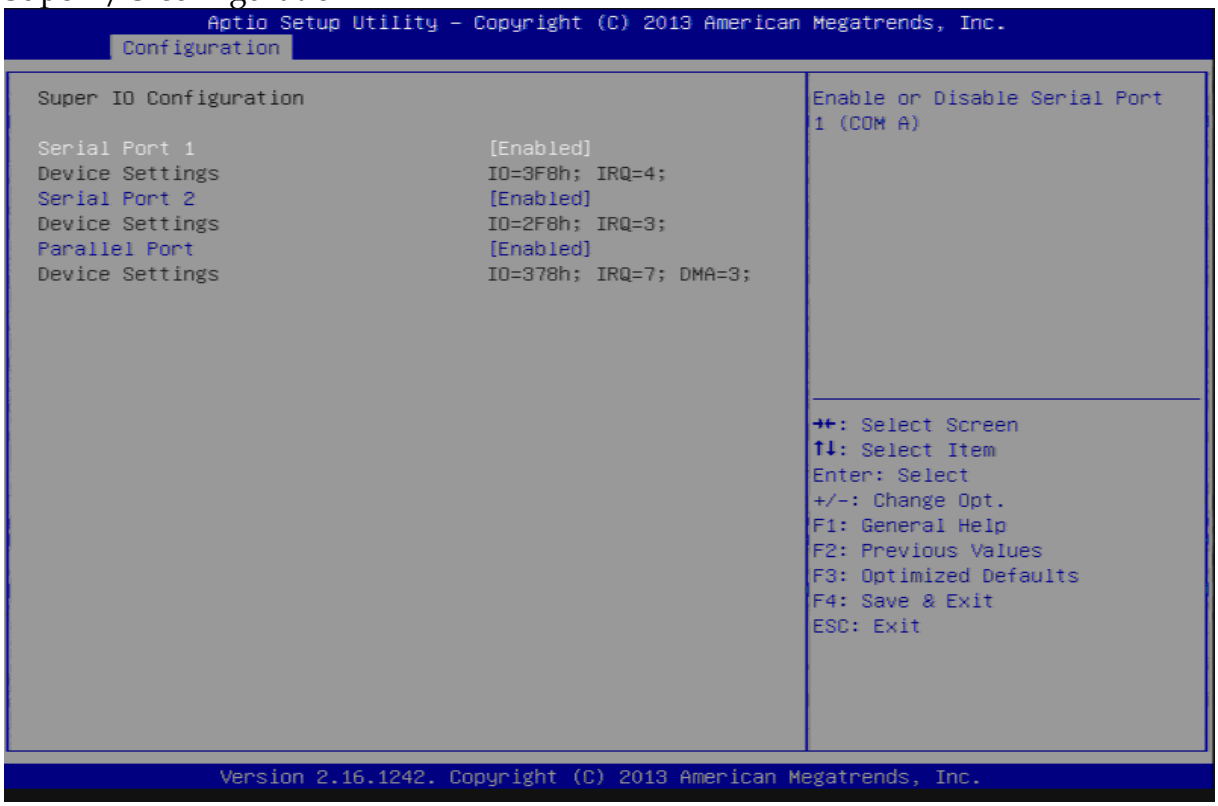

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
TPM Configuration
Security Device Support [Disabled]
Current Status Information
NO Security Device Found
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Security Device Support

Enable or Disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.
Choices: Disabled, Enabled.

Super IO Configuration

Super I/O configuration


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Configuration
Super IO Configuration
Serial Port 1 [Enabled]
Device Settings IO=3F8h; IRQ=4;
Serial Port 2 [Enabled]
Device Settings IO=2F8h; IRQ=3;
Parallel Port [Enabled]
Device Settings IO=378h; IRQ=7; DMA=3;
Enable or Disable Serial Port 1 (COM A)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

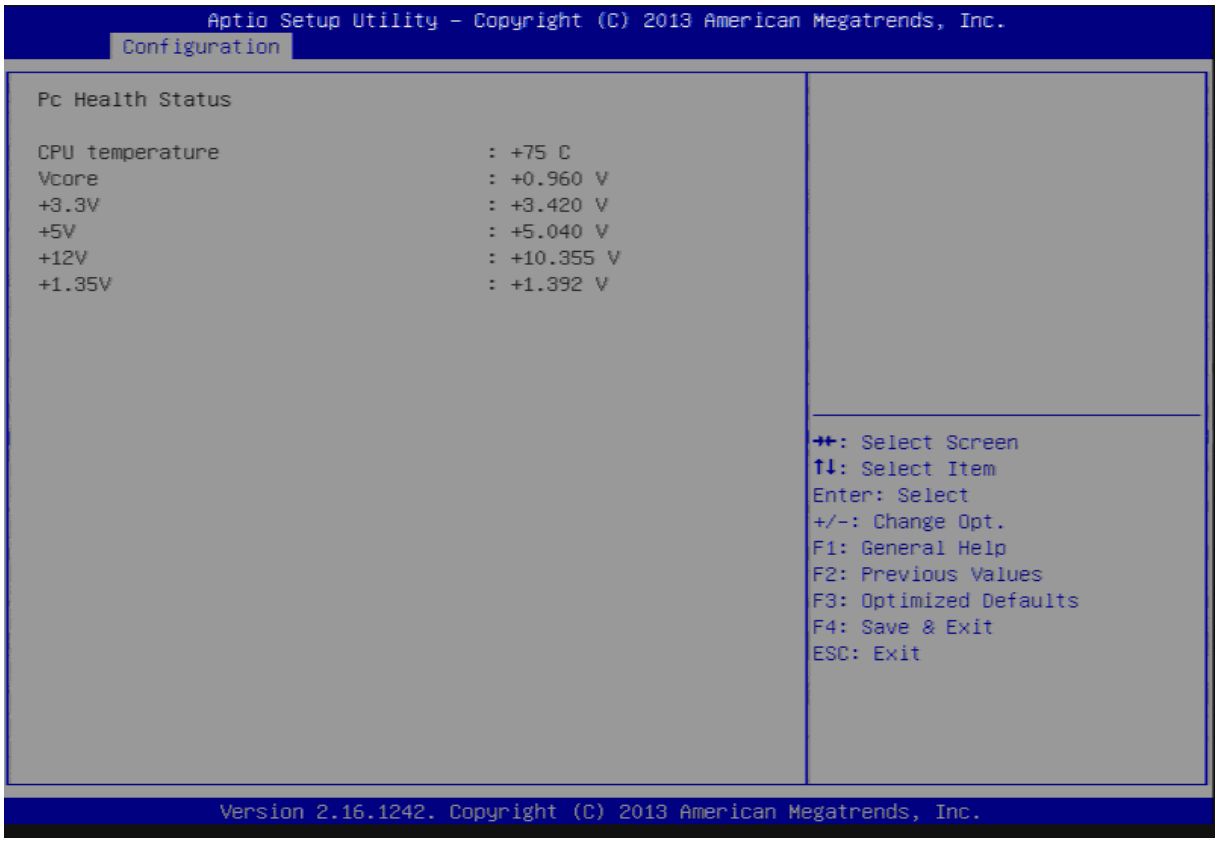
Serial Port 1
Choices: Disabled, Enabled.

Serial Port 2
Choices: Disabled, Enabled.

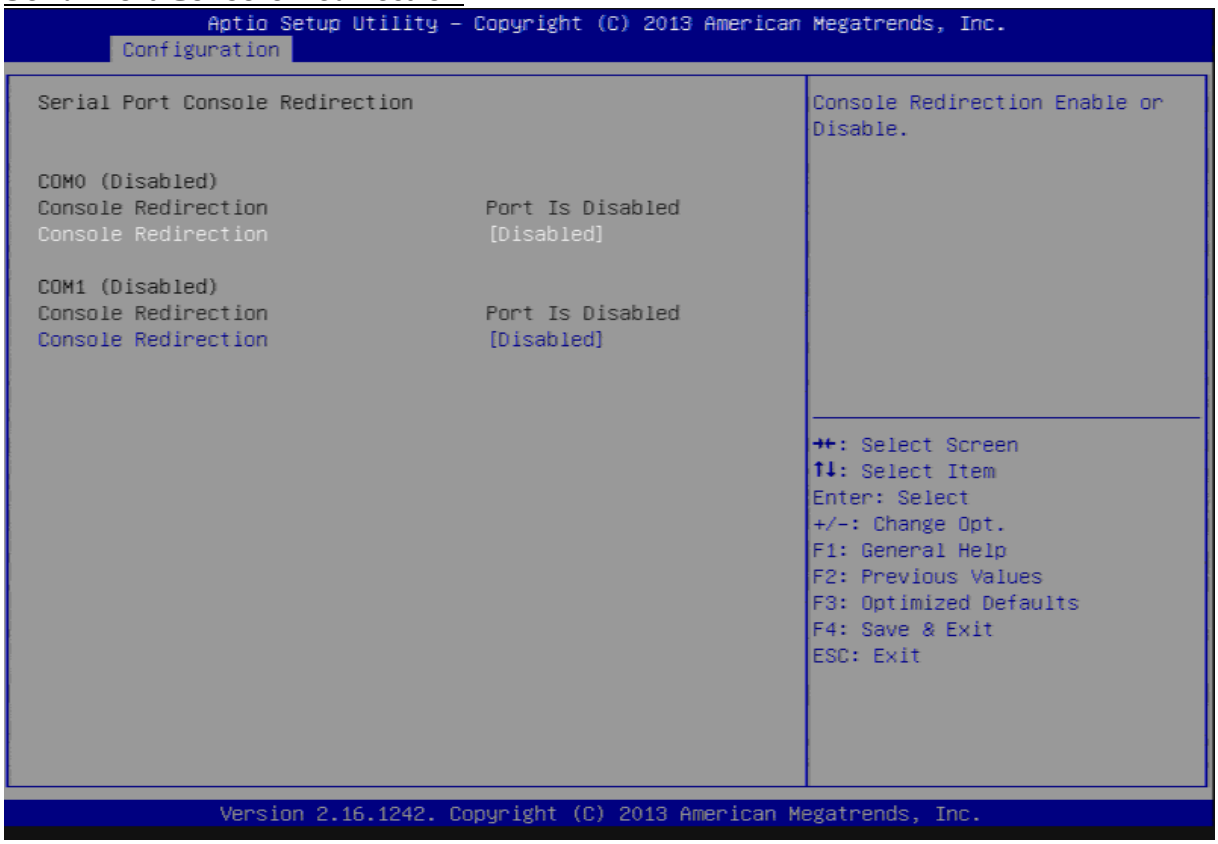
Parallel Port
Choices: Disabled, Enabled.

H/W Monitor

Monitor Hardware Status.



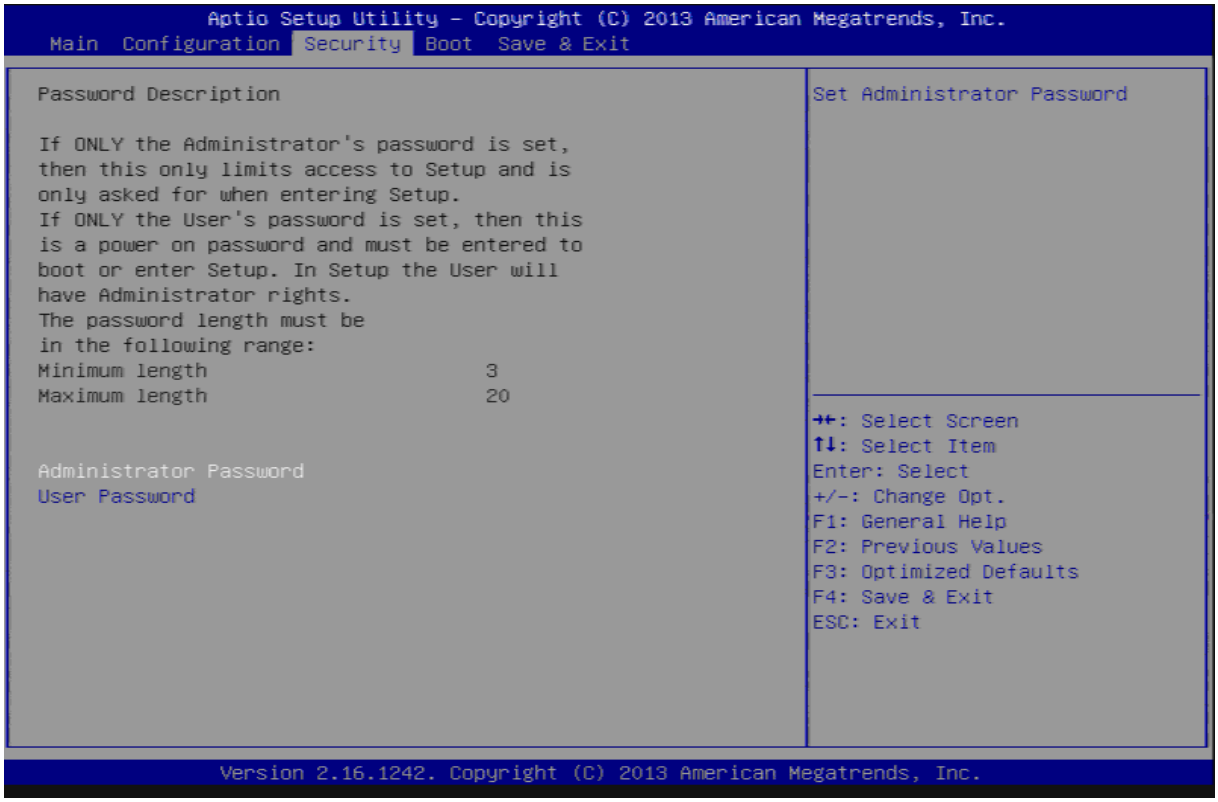
Serial Port Console Redirection



COM 0
Console Redirection
Choices: Disabled, Enabled.

COM 1
Console Redirection
Choices: Disabled, Enabled.

4.4 Security

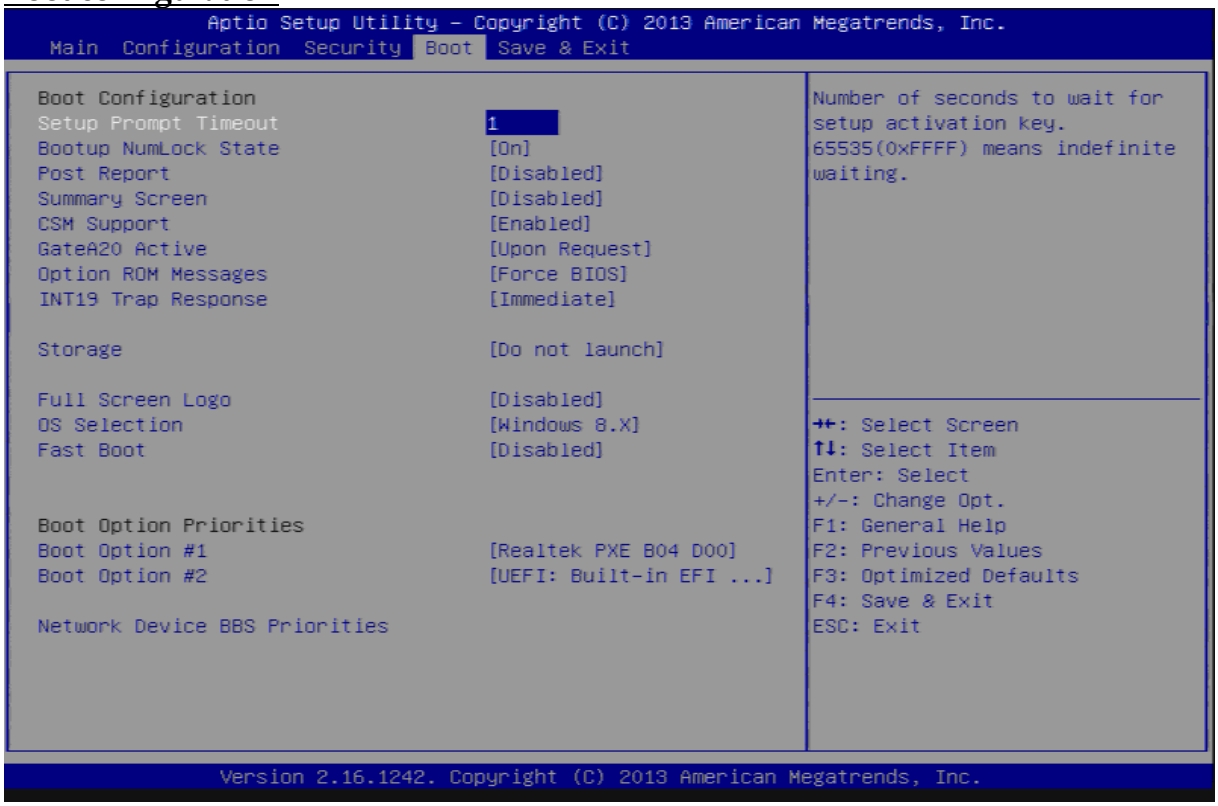

Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Configuration Security Boot Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Administrator Password
Set Administrator Password.

User Password
Set User Password.

4.5 Boot

Boot configuration



Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Choices: 0, 1, etc.

Bootup NumLock State

Select the keyboard Numlock state.
Choices: On, off.

Post Report

Post report support enable/disable.
Choices: Disabled, Enabled.

Summary Screen

Summary Screen support Enable/Disable.
Choices: Disabled Enabled.

CSM Support
Enable/Disable CSM support.
Choices: Disabled, Enabled.

GateA20 Active
UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is excused above 1MB.
Choices: Upon Request, Always.

Option ROM Messages
Set display mode for option ROM
Choices: Force BIOS, Keep Current.

INI19 Trap Response
BIOS reaction on INT19 trapping by option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.
Choices: Immediate, Postponed.

Storage
Controls the execution of UEFI and Legacy Storage OpROM.
Choices: Do not launch, UEFI only, Legacy only.

Full Screen Logo
Enable or Disable quiet boot option and full screen logo.
Choices: Disabled, Enabled.

OS Selection
Choices: Windows 8.X, windows 7.

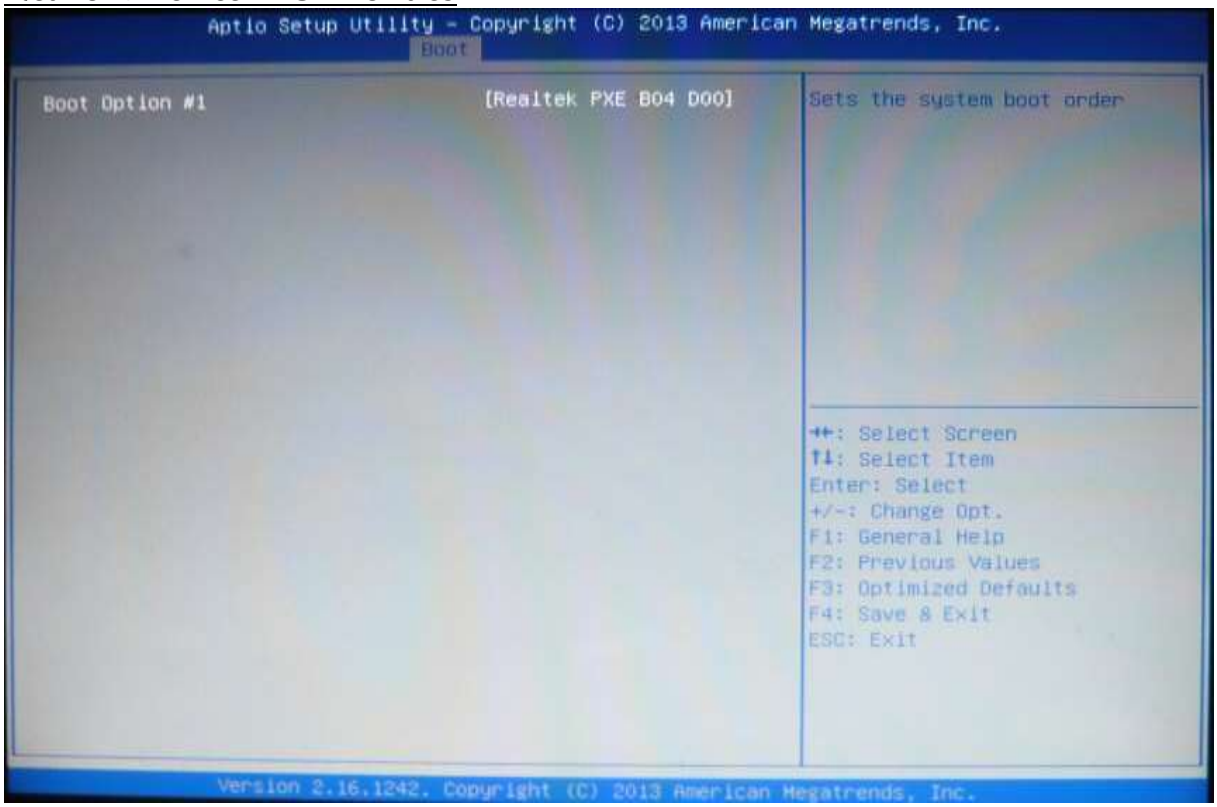
Fast Boot
Enable or disable boot with initialization of a minimal set of devices required to launch active for BBS boot options.
Choices: Disabled, Enabled.

Boot Option Priorities

Boot Option #1
Sets the system boot order.
Choices: Realtek PXE B04 D00, UEFI: Built-in EFI Shell, Disabled.

Boot Option #2
Sets the system boot order.
Choices: Realtek PXE B04 D00, UEFI: Built-in EFI Shell, Disabled.

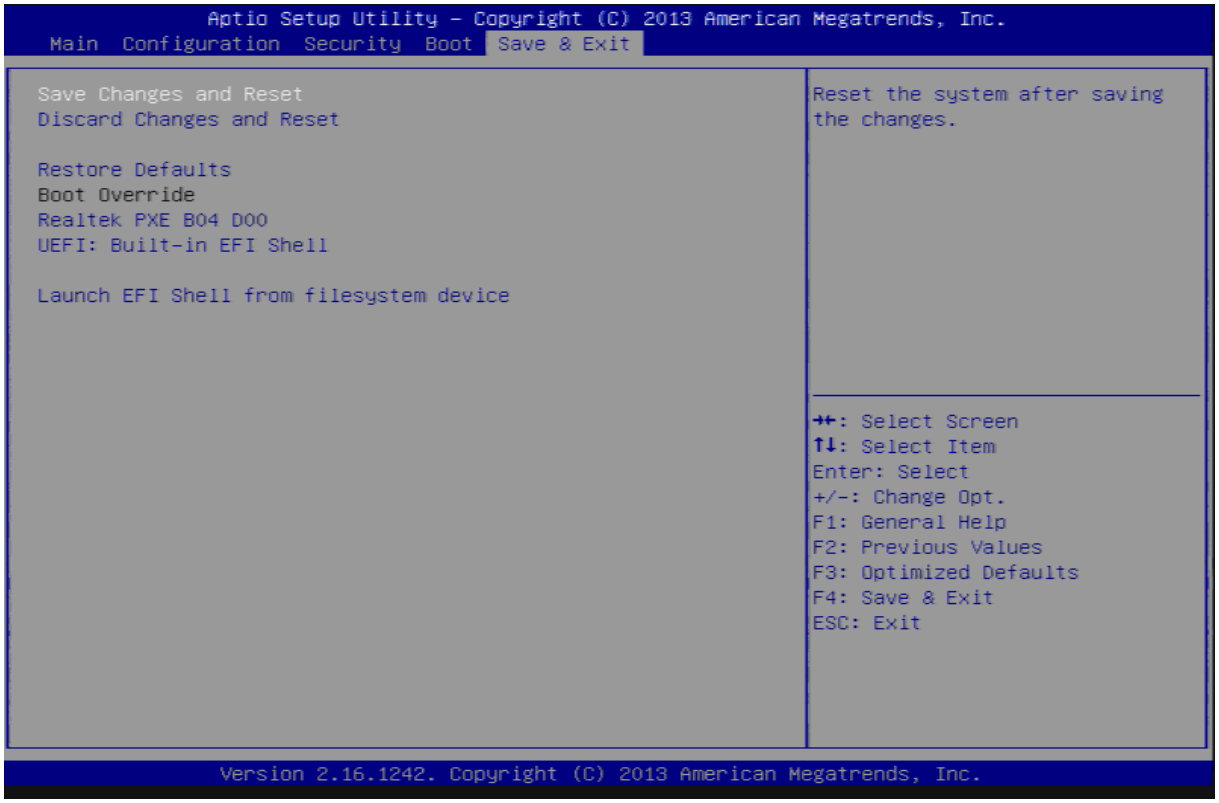
Network Device BBS Priorities



Boot Option #1

Choices: Realtek PXE B04 D00, Disabled.

4.6 Save & Exit


Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
Main Configuration Security Boot Save & Exit
Save Changes and Reset
Discard Changes and Reset
Restore Defaults
Boot Override
Realtek PXE B04 D00
UEFI: Built-in EFI Shell
Launch EFI Shell from filesystem device
Reset the system after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Save Changes and Reset
Reset the system after saving the changes.

Disable Changes and Reset
Reset system setup without saving any changes.

Restore Defaults
Restore/Load Default values for all the setup options.

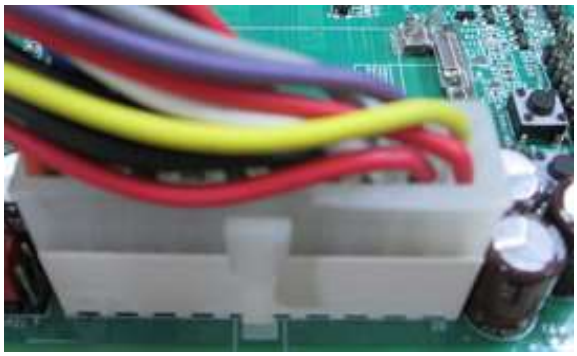
Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get PEM-E203 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

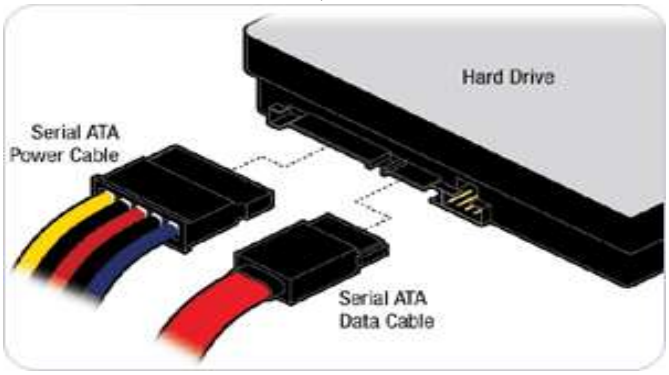
Unlike other Single board computer, PEM-E203 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—CN18 (20 pins ATX Power Connector) in the PEM-C200 carrier board.



Serial ATA

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time;
The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.

The PEM-E203 can support two SATA interface (SATAII, 3.0Gb/s) of which one is used for Onboard SSD,the other one to the ETX SATA connector.



PATA

The PEM-E203 can support two PATA ports(CN16 & CN17) on PEM-C200 carrier board.

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. USB keyboard and mouse, SATA hard disk, VGA connector, power cable of the devices, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with PEM-E203, it is recommended, when going with the boot-up sequence, to hit "F2" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to **"Load Setup Defaults"**, press "**Enter**" and select **"Yes**" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

5.3 FAQ

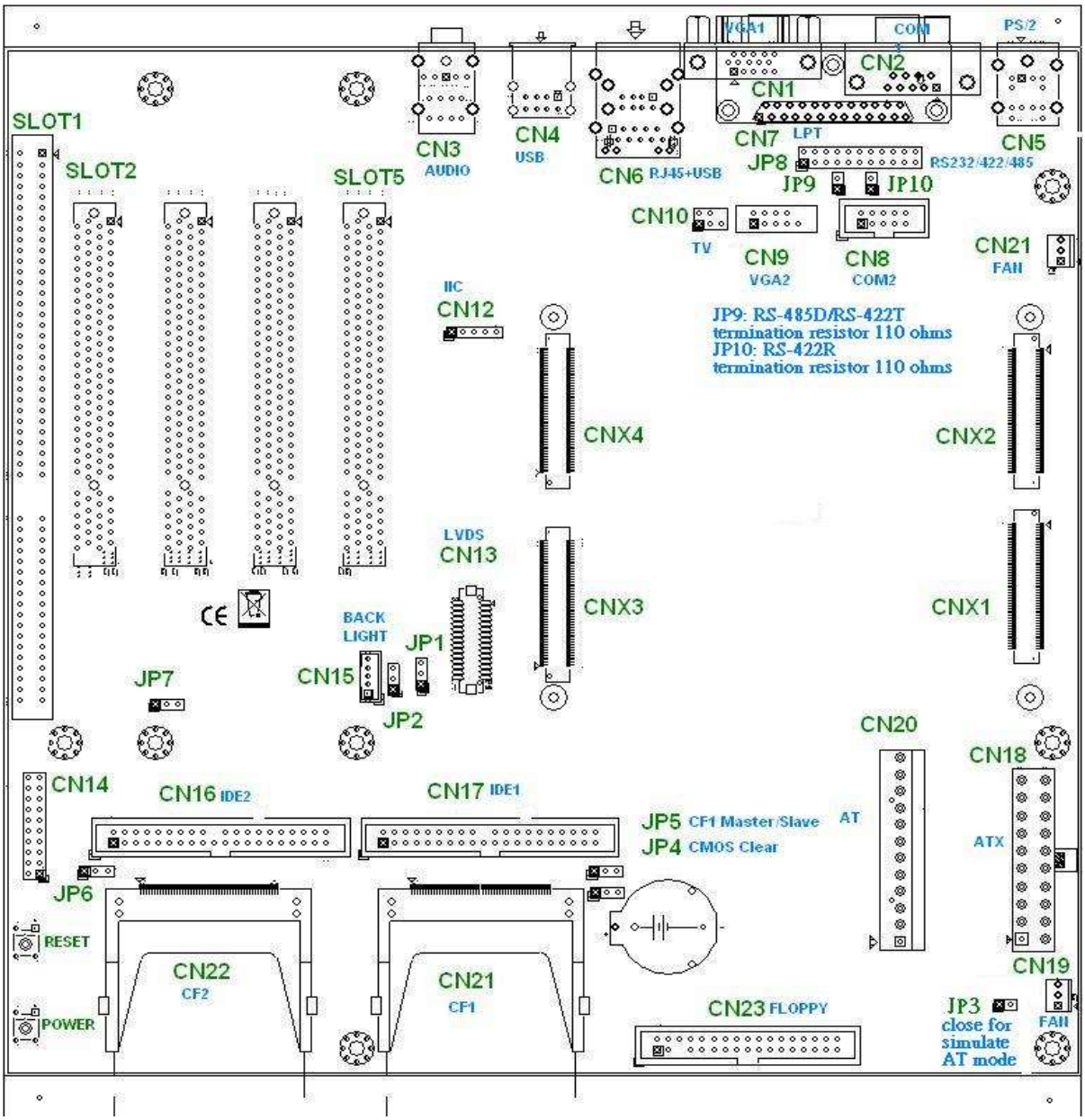
Information & Support

Question: I forget my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the JP4 of the PEM-C200 carrier board to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

JP4：CMOS Setting

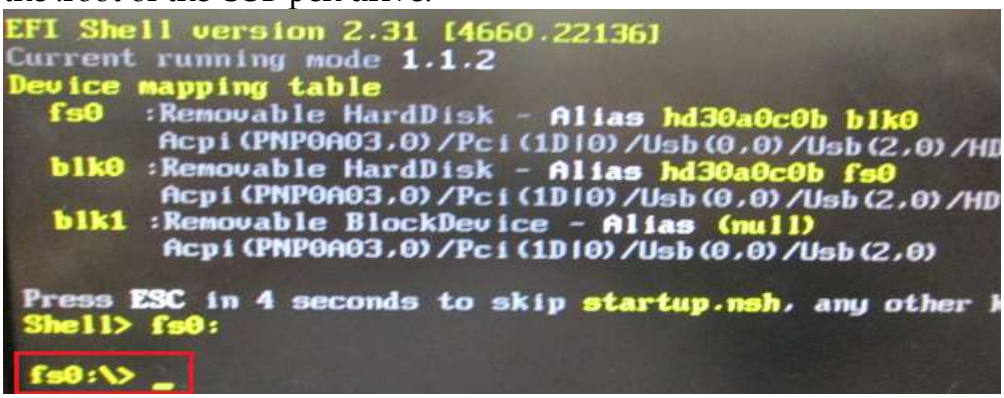
	Jumper Setting Describe
*1-2	Default
2-3	Clean CMOS



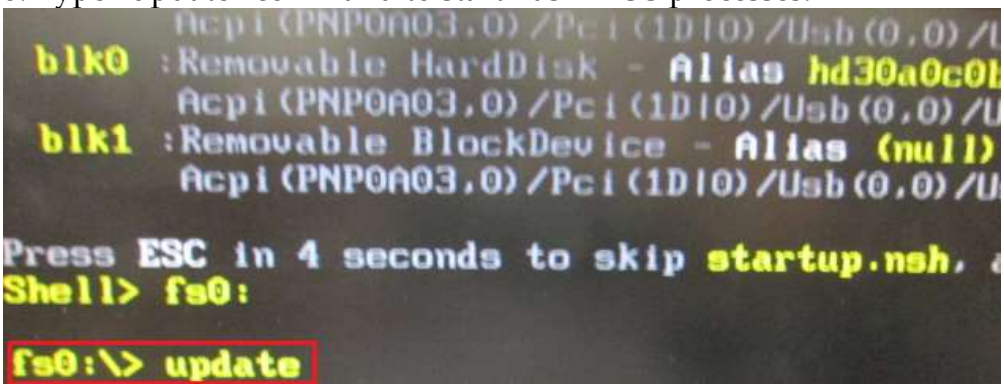
Question: How to update the BIOS file of the PEM-E203?

Answer: 1. Please visit web site of the Portwell download center as below hyperlink
http://www.portwell.com.tw/support/download_center.php
But you must register an account first. (The E-Mail box should be an existing Company email address that you check regularly.)
http://www.portwell.com.tw/member/newmember.php
2. Input your User name and password to log in the download center.
3. Select the "Search download" to input the keyword "PEM-E203".
4. Find the "BIOS "page to download the ROM file and flash utility.
5. Execute the zip file to root of the bootable USB pen drive. You can get hose"fparts.txt","fpt64.efi","temp.bin","Update.nsh" four files.
6. Insert your USB pen drive in USB port of the PEM-C200 carrier board .and power-on.

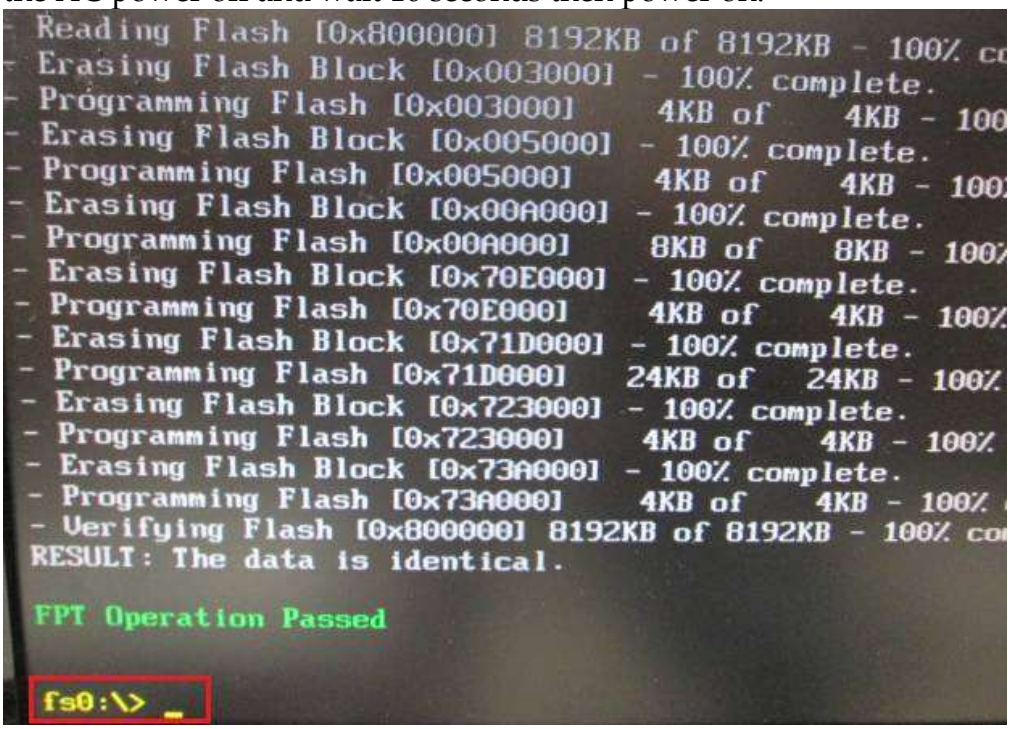
7. Boot to EFI-Shell mode then input the "fs0:" command to switch to the .root of the USB pen drive.


EFI Shell version 2.31 [4660.22136]
Current running mode 1.1.2
Device mapping table
fs0 :Removable HardDisk - Alias hd30a0c0b blk0
Acpi(PNP0A03,0)/Pci(1D|0)/Usb(0,0)/Usb(2,0)/HD
blk0 :Removable HardDisk - Alias hd30a0c0b fs0
Acpi(PNP0A03,0)/Pci(1D|0)/Usb(0,0)/Usb(2,0)/HD
blk1 :Removable BlockDevice - Alias (null)
Acpi(PNP0A03,0)/Pci(1D|0)/Usb(0,0)/Usb(2,0)
Press ESC in 4 seconds to skip startup.nsh, any other
Shell> fs0:
fs0:\> _

8. Type "update" command to start flash BIOS processes.



9. When it finished all BIOS writing processes back to "fs0:\>", please cut the AC power off and wait 10 seconds then power on.


- Reading Flash [0x800000] 8192KB of 8192KB - 100% co
- Erasing Flash Block [0x003000] - 100% complete.
- Programming Flash [0x003000] 4KB of 4KB - 100
- Erasing Flash Block [0x005000] - 100% complete.
- Programming Flash [0x005000] 4KB of 4KB - 100
- Erasing Flash Block [0x00A000] - 100% complete.
- Programming Flash [0x00A000] 8KB of 8KB - 100
- Erasing Flash Block [0x70E000] - 100% complete.
- Programming Flash [0x70E000] 4KB of 4KB - 100
- Erasing Flash Block [0x71D000] - 100% complete.
- Programming Flash [0x71D000] 24KB of 24KB - 100%
- Erasing Flash Block [0x723000] - 100% complete.
- Programming Flash [0x723000] 4KB of 4KB - 100%
- Erasing Flash Block [0x73A000] - 100% complete.
- Programming Flash [0x73A000] 4KB of 4KB - 100%
- Verifying Flash [0x800000] 8192KB of 8192KB - 100% co
RESULT: The data is identical.
FPT Operation Passed
fs0:\> _

10. Please press the “F2” key to BIOS setup menu to select “Load Setup efaults” and then select “Exit Saving Changes” option to finish all BIOS flash processes.

Note:

Please visit our Download Center to get the Catalog, User manual, BIOS, and driver files.
http://www.portwell.com.tw/support/download_center.php
If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.
http://www.portwell.com.tw/support/problem_report.php
We will do our best to provide a suggestion or solution for you.
Thank